LIVES
OF
GAME ANIMALS

PLATE I.—GRIZZLY BEAR

Life study by E. T. Seton in 1886. From specimen in Philadelphia Zoo

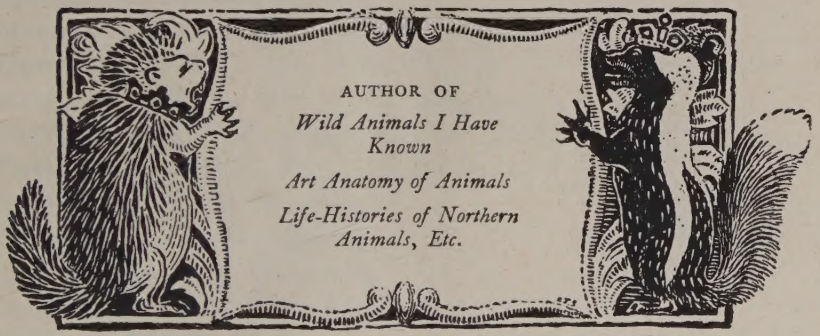
LIVES
OF
GAME ANIMALS

An Account of those Land Animals in America, north of the Mexican Border, which are considered "Game," either because they have held the Attention of Sportsmen, or received the Protection of Law.

BY

ERNEST THOMPSON SETON

FELLOW NEW YORK ZOÖLOGICAL SOCIETY
MEMBER NAT. INST. ARTS AND LETTERS



WITH 50 MAPS AND 1500 ILLUSTRATIONS
BY THE AUTHOR

VOLUME II

BEARS, COONS, BADGERS, SKUNKS, AND WEASELS

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Barren-ground Grizzly.—Dr. R. M. Anderson.
Alaska Brown-bear.—Dr. W. H. Osgood.
MacFarlane's Bear.—Dr. R. M. Anderson.
Blackbear.—Dr. C. C. Adams and M. P. Skinner.
Kermode's Bear.—Dr. R. M. Anderson.
Polar Bear.—Dr. E. W. Nelson.
Raccoon.—Dr. E. W. Nelson.
Coatimundi.—E. A. Goldman.
Cacomistle.—Dr. C. Hart Merriam.
Badger.—W. B. Bell.
Common Skunk.—A. H. Howell.
Hooded Skunk.—Dr. W. H. Osgood.
Hog-nosed Skunk.—Vernon Bailey.
Spotted Skunk.—A. H. Howell and E. A. Preble.
Wolverine.—Dr. R. M. Anderson.
Fisher.—E. A. Preble.
Marten.—Dr. C. C. Adams.
Mink.—L. D. McClintock.
Sea-mink.—Dr. W. H. Osgood.
Blackfooted Ferret.—E. R. Warren.
Bridled Weasel.—Dr. W. H. Osgood.

Short-tailed Weasel.—H. H. T. Jackson.
Long-tailed Weasel.—Dr. Witmer Stone.
Least Weasel.—Dr. Witmer Stone.
Sea-otter.—Dr. L. Stejneger and E. A. Preble.
Otter.—G. S. Miller, Jr.

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PREFACE

Volume II is done. It has been delayed through the abundance of material, the superabundance of ideas, new and sometimes incredible, that continued to arrive and demand consideration. Some have been included that are not in the line of modern thought; that is, of the established order. As light on their significance, I offer two incidents—a history and a fable.

In England, about 1770, smallpox of a deadly type was rife. A dairymaid, allured by the high wages, offered to nurse those stricken with the disease. When warned that she was risking her life, she replied: "I cannot take that disease; I have had cow-pox." This old wives' tale amused the doctors and they dismissed it with a laugh. But one of the younger men said: "Let us investigate before condemning." He did so, and thus laid the foundation of the whole modern school of prophylactic medicine. His name was Edward Jenner.

A venerable old man with a pen behind his ear, ink on his fingers, and a bag on his back, went up the main street of Humantown, calling out as he went:

"Lies! Any old lies to-day? Biscuits for lies to-day!"

He had a basket of sweet wafers, or biscuits, on one arm, and they were shaped like a human ear. These he was exchanging for the lies, that were very abundant in this town.

Most of the inhabitants freely gave them to the man; some even pressed them on him; but a few had to be repaid with at least a wafer. Very soon, the old man's bag was full.

It was a new thing to collect lies, and many jokes were bandied at the expense of the old man and his odd occupation.

The strange merchant left the main street, and a little child had the curiosity to follow him. The venerable one turned aside through a door into a beautiful garden in the very heart of the town, and yet quite unknown. He closed the door, but the child peeped through the keyhole and saw the old man take the bag of lies and give it a good shake. There was a commotion and a seething inside for a time, and the mass seemed to be smaller.

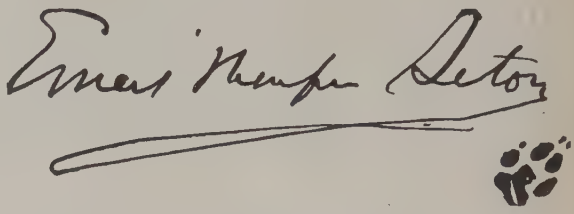
"Ah, hear them eating each other up!" chuckled the old man.

Another shake was followed by more commotion and another shrinkage. The collector's face beamed.

A few more shakes, and the bag seemed actually empty; but the old man opened it carefully, and there in the far corner, was a pinch of pure gold.

The child reported all these things, and the next time they saw the old man, the people demanded who he was. He answered:

"*I am the historian.*"



THE SCOPE

—

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CATS, WOLVES, AND FOXES

VOLUME II

BEARS, RACCOONS, BADGER, SKUNKS, AND WEASELS

VOLUME III

DEER, ANTELOPE, BUFFALO, SHEEP, AND PECCARY

VOLUME IV

SQUIRRELS, RABBITS, ARMADILLO, AND OPOSSUM

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LIVES
OF
GAME ANIMALS

Volume II

Order Carnivora or Flesh-eaters

BEARS, RACCOONS, BADGER, SKUNKS, AND WEASELS

ORDER CARNIVORA OR FLESH-EATERS

Mostly large animals (except the Weasels). All our species (except the Sea-otter) have 6 small incisors in each jaw; all have 4 *large canine teeth*, and the premolars developed, not to grind, but to cut like shears.

3. Family Ursidae or Bears

Large, plantigrade animals, with 5 well-developed toes on each foot; long, non-retractile claws; skull with prolonged muzzle; ears moderate and rounded; clad in dense hair, usually of one colour without stripes or spots, excepting a few touches of white on the breast. Tail very short.

Teeth usually; Inc. $\frac{3-3}{3-3}$; can. $\frac{1-1}{1-1}$; prem. $\frac{4-4}{4-4}$; mol. $\frac{2-2}{3-3} = 42$

Genus *Ursus* Linnæus, as above, but size very large; soles of feet more or less naked; colour various, usually dark.

Genus *Thalarctos* Gray, as above, but neck prolonged; soles of feet hairy, with small, bare pads; white at all seasons.

4. Family Procyonidae or Raccoons

Bear-like animals of small size, thickset; black mask, or other dark markings on the face; tail, moderately long, bushy, with black rings; 5 toes on each foot; soles naked; claws, sharp and non-retractile; ears, moderate; fur dense; muzzle pointed.

Teeth: Inc. $\frac{3-3}{3-3}$; can. $\frac{1-1}{1-1}$; prem. $\frac{4-4}{4-4}$; mol. $\frac{2-2}{2-2} = 40$

Genus *Procyon* Storr, as above, but tail moderate, with about 7 dark rings.

Genus *Nasua* Storr, as above, but tail very long, with faint, dark rings, snout prolonged and almost pig-like; ears, very short.

Genus *Bassariscus* Coues, as above, but head short, ears large; toes short; soles hairy; body slender; tail as long as body, and white, with 6 or 8 black rings.

5. Family Mustelidae or Weasels

Medium-sized or small animals; plantigrade or digitigrade; 5 toes on each foot, with well-developed, non-retractile claws; ears, small; colour, various; anal glands, highly developed.

$$\text{Teeth usually: Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{3-3}{3-3}\text{; mol. } \frac{1-1}{2-2} = 34$$

Genus *Taxidea* Waterhouse, as above, but body, short and strong; tail, very short; legs, short; fore claws, very large and strong; fur, grayish-white, with black markings on the head.

Genus *Mephitis* Geoffroy and Cuvier, as above, with size of a Cat or less; tail, very long and bushy; anal glands, greatly developed; ears, short; colour, black with white markings.

Genus *Conepatus* Gray, as above; thickset, heavy animals, with all white tail and back; other parts, black.

$$\text{Teeth: Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{2-2}{3-3}\text{; mol. } \frac{1-1}{2-2} = 32$$

Genus *Spilogale* Gray, as above; slender body; black fur with spots and bars of white.

Genus *Gulo* Pallas, as above; large, stout, bear-like animals; tail, short and bushy; hairy soles; massive skull.

$$\text{Teeth: Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{4-4}{4-4}\text{; mol. } \frac{1-1}{2-2} = 38$$

Genus *Martes* Pinel, as above; small animals; soft, dense fur; long, bushy tails; sharp, non-retractile claws; short ears; muzzle, long and sharp; arboreal in habits; teeth as in *Gulo*.

Genus *Mustela* Linnæus, small animals; brown above with spots or stripes; tail, moderate or long; black tail-tip, even when they turn white in winter; short legs; long, slender bodies; teeth as in Family.

Genus *Enhydra* Fleming, large animals, looking like Seals; hind limbs developed as flippers; front legs very short; teeth as in Family, but lacking 2 lower incisors.

Genus *Lutra* Brisson, large animals, with very short limbs; specialized for life in the water.

$$\text{Teeth: Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{4-4}{3-3}\text{; mol. } \frac{1-1}{2-2} = 36$$

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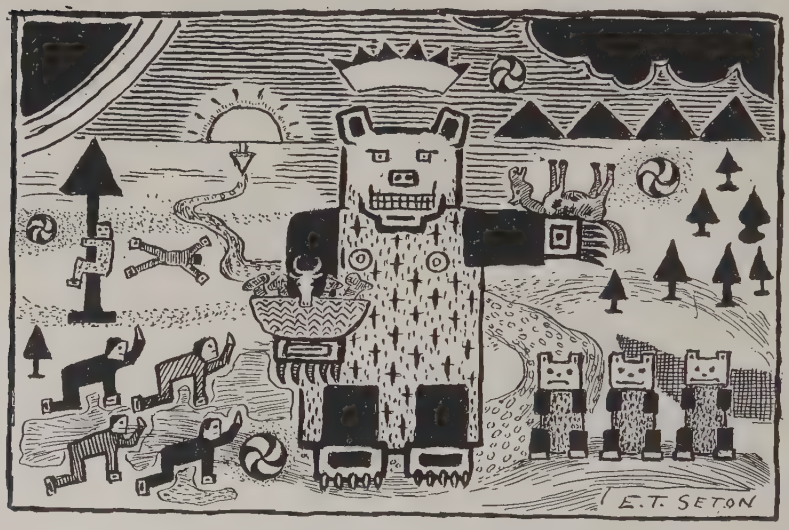


Grizzly-Bear, Silver-tip, Roachback, White Bear, Gray Bear of Hudson's Bay Co., Range Bear, Baldface, Big Bear of the Mountains, Old Ephraim

Ursus horribilis Ord

(L. *Ursus*, a Bear; L. *horribilis*, horrible)

Ursus horribilis Ord, 1815, Guthr. Geog., 2nd Am. ed., II, pp. 291 and 300.

Type Locality—Missouri River, a little above mouth of Poplar River, northeastern Montana

French Canadian, *l'Ours gris ou féroce.*
Cree and Ojibway, *Mish-e muk-wá.*
Chipewyan, *Klay-zy* (Seton); *Sas-tel-kie* (B. R. Ross, Mamm. Mack. R., 1861, p. 139).
Ogallala Sioux, *Mah-tó shah-kaý hanskâ.*
Nez Percé or Chopunnish, *Hohost* (Lewis & Clark).

The name "Grizzly" or "gray" was, according to the Century Dictionary, given to this Bear on account of "its usual colouration." The word "grisly" (gruesome, grim, or terrible) was applied later, and was evidently in mind with Ord when he gave the scientific name.

The Bear Family *Ursidae* is composed of very large, heavy, thickset, carnivorous animals of dull colours, not regularly spotted or striped. They have 5 well-developed toes on each foot; their hind feet are plantigrade; they have fixed claws; very short tails; short, rounded ears, and the true molars with broad, flat tuberculated crown.

The genus *Ursus* (Linnæus, 1758) has the above characters, with colours, black, dull brown, yellowish gray, or white, and the following dentition (often wanting in premolars):

$$\text{Inc. } \frac{3-3}{3-3}; \text{ can. } \frac{1-1}{1-1}; \text{ prem. } \frac{4-4}{4-4}; \text{ mol. } \frac{2-2}{3-3} = 42$$

Size. In combination with the above family and generic characters, the Grizzly has very distinctive specific features of size and colour.

A large specimen killed by Lewis and Clark, near Porcupine River in Montana, measured as follows:

Length from nose to extremity of hind foot	8 ft.	7½ in.	(2,630 mm.)
Circumference near the fore leg	5 "	10½ "	(1,790 mm.)
" of the neck	3 "	11 "	(1,194 mm.)
" " " middle of the fore leg	1 "	11 "	(584 mm.)
Length of the talons		4⅜ "	(111 mm.)[1]

"But this was not the largest Bear killed by the party. They give an account of one which measured 9 ft. [2,743 mm.] from the nose to the extremity of the tail, and the talons of another were 6¼ in. [159 mm.] in length."[2]

The following sizes and weights are furnished by John M. Phillips of Pittsburgh, Pa. The Grizzlies in question were killed by himself in 1908–09 on the Bull River in the East Kootenay District of British Columbia:

Large Male Grizzly

Length, end of nose to root of tail	6 ft.	3 in.
Height at shoulder	3 "	3 "
Length skull, measured around circle on top		16⅝ "
Length skull, straight measurement		15½ "
Length of skin when removed	7 "	11 "
Width of skin over claws	9 "	5½ "
Weight, allowing 12 lbs. for blood	409½ lbs.	

This Bear was killed in September, 1908. It was a full-grown old ♂ but rather thin.

Male Grizzly

Length end of nose to root of tail	6 ft.	0 in.
Height at shoulder	3 "	0 "
Length skull, measured around circle on top		14½ "
Length skull, straight measurement		14 "
Weight, allowing 12 lbs. for blood	353½ lbs.	

This Bear was a full-grown ♂.

Male Grizzly

End of nose to root of tail	6 ft. 7 in.
Total weight	487 lbs.

[1] Ord's Zoölogy, Rhoads reprint, 1894, p. 300.

[2] As above, p. 300.

Phillips adds: "I also weighed a medium-size ♀ at 320 lbs."

The record monster, killed by Arthur Young, in Yellowstone Park in 1920, "stood nearly 4 ft. high at the shoulders, while his skull measured 18½ in. long; his entire body length was 7 ft., 4 in."[3] His weight is given later.

Though such a monster, this Bear was smaller than either of the large ones taken by Lewis and Clark along the Missouri, as already noted.

From various data at hand, I should say that an ordinary ♂ Grizzly stood about 3½ ft. (1,067 mm.) at the shoulder; and a ♀, about 3 ft. (914 mm.).

The hind foot of an ordinary adult is about 10 in. (254 mm.) long from heel to tip of longest claw; 9 in. (229 mm.) would be small, and 12 in. (305 mm.) very large. Of course, the track is larger than the foot.

The creature looks so big when charging over the mountainside or lying stretched at the feet of the victorious and excited sportsman, that all guesses at its weight, etc., have been absurdly high.

I remember once watching a good-sized Grizzly walk past; had I *guessed* his height at the shoulder I should have said at least 4 ft. (1,220 mm.). But I noticed that he passed without stooping under a certain horizontal branch, and this I afterward found to be but 35 in. (889 mm.) from the ground.

Weight. Wild as the guesses have been when dealing with the size of a Grizzly, they are safe and sane compared with those ventured on his weight. There is no reason to believe that a true Grizzly ever weighed 1,500 lbs., or that any but the giants reach 1,000 pounds; 500 pounds is more nearly the average weight of ♂'s and 400 of ♀'s. Colonel W. D. Pickett, of Meeteetsee, Wyo., for thirty-five years one of the most successful Grizzly hunters in the West, says that of 40 wild Grizzlies that he actually weighed, the heaviest went less than 800 lbs.[4]

In the Washington Zoo is the large Grizzly from the Yellowstone Park. In September, 1894, he weighed 730 lbs., and has since added considerably to his bulk. Of course, he is cage-fat.

The heaviest Grizzly in Rowland Ward's "Records of Big Game,"[5] is 735 lbs. Its skin is 8 ft. 0 in. long. It was taken in New Mexico by Montagu Stevens.

One of the largest wild Grizzlies ever killed weighed 916 lbs. This was

[3] Hunting with Bow, p. 240.

[4] Personal letter to G. O. Shields of Recreation.

[5] P. 503, 1922 ed

the monster killed in the Yellowstone Park *with one arrow*, by Arthur Young of San Francisco, in May, 1920. Dr. Saxton Pope, who was in at the death, writes: "As we dismembered him, we weighed the parts. The veins were absolutely dry of blood, and without this substance, which represents a loss of nearly 10 per cent. of his weight, he was 916 lbs. There was hardly an inch of fat on this back. At the end of the autumn, this adipose layer would be nearly 6 in. thick. He would then have weighed over 1,400 lbs."[6]

The record-bearer for weight among wild Grizzlies was the Okanagan cattle-killer, details of whose history appear in the cattle-killing section. "This Bear weighed over 1,100 lbs." [7]

The heaviest weight on authentic record is 1,153 pounds. This was given by G. O. Shields as the weight of an enormous Grizzly that lived 18 years in Union Park, Chicago. "He was fed to suffocation by the thousands of visitors and in his later years grew so fat that he could not walk, could only crawl around."[8] The *estimates* set his weight at 2,000 to 2,200 lbs.; that is, at double his actual weight.

Arthur E. Brown, former Director of Philadelphia Zoo, has dealt with the subject in a vein of delicate humour. After ample opportunities covering many years, he wrote:

"It is a curious fact in the geographical distribution of animals—for which an explanation might be sought among ethical rather than physical causes—that 1,000-pound Bears are not found inhabiting the same range of country as Fairbanks' scales. I have seen but one Grizzly actually weighed, and that was a male which died in the Philadelphia Zoölogical Garden in 1881; a larger and finer specimen than the average, and which weighed a trifle under 500 lbs.

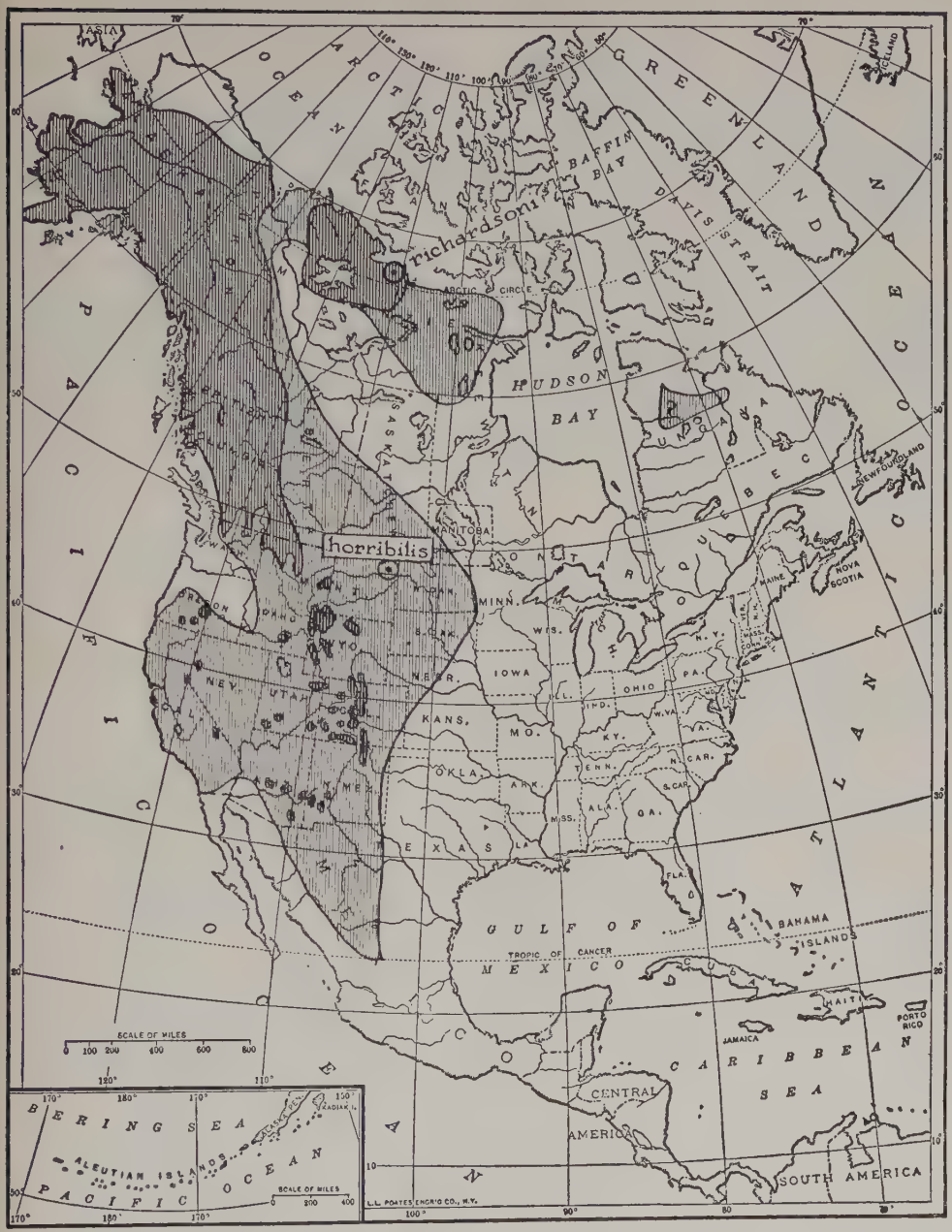
"By far the largest of these Bears that I have seen were one from the Sierra Nevadas, known as 'Sampson,' who, with his owner, old 'Grizzly Adams,' was the delight of my schoolboy holidays, 30 years ago, in Barnum's Museum at Broadway and Ann Street, New York; and the male of a pair now in the Cincinnati Zoölogical Garden, which, I am informed by Mr. Stephan, the superintendent, were captured in San Joaquin County, California, in 1871. Quite recently this Bear was under discussion between Mr. F. J. Thompson, the former superintendent of the Cincinnati Garden, and myself, and we independently estimated his weight at 800 lbs. I am disposed to believe that he is quite as large as 'Sampson.'"[9]

[6] Hunting with Bow, pp. 239–40.

[7] Ann. Rep. Dept. Agri., 1924, p. 8.

[8] Recreation, Aug., 1899, p. 135.

[9] Forest & Stream, Dec., 1893, p. 518.



MAP I.—RANGES OF THE GRIZZLY-BEARS AND OF THE BARREN-GROUND BEAR

By E. T. Séton, with assistance of the Biological Survey

Range of the Grizzly-bears. Ancient range in pale tint; range in 1921, in dark tint. In the United States, copied from Merriam's map.

Range of Barren-ground Bear, east of the Mackenzie River and possibly Labrador. Ancient range in pale tint; present range in dark tint about Great Bear Lake. Corrected by R. M. Anderson.

Grizzly Adams himself described Samson as "the largest specimen of the Grizzly species, perhaps, that ever was taken alive. . . . Samson whose weight is over 1,500 lbs."[10] That is to say, Adams's guess was 1,500 lbs. Brown, with much more experience of weighing Bears, set his weight at half that.

Colour. In general, the Montana Grizzly is of a deep brown colour; darkening to brownish black along the spine, on the limbs, and on the ears, and grizzled or frosted over with a white tipping of the hair on the upper parts of the body. In some individuals, the tipping is so reduced that the Bear looks deep brown or cinnamon; in others it is so increased that the Bear at a distance looks dirty white; but, in all, the limbs are dark. Another general feature of colour is an upright bar or patch of dull white behind the shoulder.

But many are yellow in various shades, and not a few are black. W. H. Wright tells of hunting a large Blackbear, and not till after it turned to face him did he discover by its long claws and general behaviour that it was simply a black Grizzly.[11]

The great Californian Grizzly had little or no silver tipping, so that it was often seen black or very dark brown. In marked exception to the rule is this note by John Muir in Yosemite Park: "This time it was a Grizzly I met. . . . His shaggy coat was well grizzled, his head almost white."[12]

Lewis and Clark, by way of illustrating the inconstancy of colour, make a note, May 14, 1806, near the Kookooskia River:

"The hunters killed a female Bear with 2 cubs. The mother was black with a considerable intermixture of white hairs and a white spot on the breast. One of the cubs was jet black, and the other of a light reddish-brown or bay colour."[13]

The distinctive external characters of the Grizzly's form are its concave facial outline (the Blackbear's is about straight), the maned hump on its back, over the shoulders, and the great size of its front claws, which are twice the length of the hind ones and but little curved.

From the Blackbear group it is easily distinguished by these peculiarities; from the Polar-bear by the latter's white colour, convex profile, hairy soles, and short claws; but to distinguish it from the many Alaskan species of Fish-bears and Brown-bears, by external characters, is not at present possible.

[10] Grizzly Adams, pp. 292, 295.

[11] Grizzly Bear, p. 99.

[12] Yosemite, p. 619.

[13] Exped., p. 305.

Classification of Grizzly-bears

(Contributed by Dr. Wilfred H. Osgood, of Field Museum, Chicago)

For long, it was supposed that there was but one Grizzly-bear in North America, all the various sizes, colours, etc., being but unimportant individual variations. A vast accumulation of study materials in our museums, especially skulls with authentic data as to sex and locality, has changed this view, and the latest special paper on the subject, that is, Dr. C. Hart Merriam's "Review" (1918), recognizes by name no less than 86 species and subspecies of so-called Grizzly and Big Brown-bears. These are divided by him into some 15 groups, but these groups are based on technical characters and do not offer any distinctions which can be readily recognized by the layman. However, the same author, in his "Preliminary Synopsis of American Bears," makes only 3 groups for all American Grizzly and Brown-bears, and these, for general purposes, may still be recognized to a considerable extent. They are as follows:

The true *Grizzly-bears*, typically grizzled or silver-tipped in colour, and with long, slender and straightened fore claws.

The *Alaskan Big Brown-bears*, the largest of living Bears, relatively uniformly coloured light creamy brown to rich blackish brown, with little or no silver-tipping, and with short, stout, curved claws. They are more nearly related to the Brown-bears of Eurasia than are the Grizzlies.

The *Sitka Bears*, rather large in size and variable in colour, with skulls suggesting those of the Grizzlies, but real relationship apparently with the Big Brown-bears.

At least two of these groups, the true Grizzlies and the typical Brown-bears, are fairly well defined, but the third may be regarded merely as indication that there are various Bears, especially on the southern coast and islands of Alaska, which do not conform either to the Grizzly or to the Brown-bear type. This does not mean that they are hybrids or "intermediates" between Grizzlies and Brown-bears. Close study reveals their distinctness from each other, and their characters are such that it is difficult, or practically impossible, to say whether any given species is nearer to the Grizzlies or to the Brown-bears, although, of course, it is clear that their general relationships are with these rather than with any other Bears.

Difficulties in the classification of large Bears are mainly with those of the coast region of Alaska, where two or even more species may be found in one locality, and in certain parts of which there are what appear to be representatives of both the Grizzlies and the Brown-bears. In the Western United States and Mexico and northward through the interior of Canada

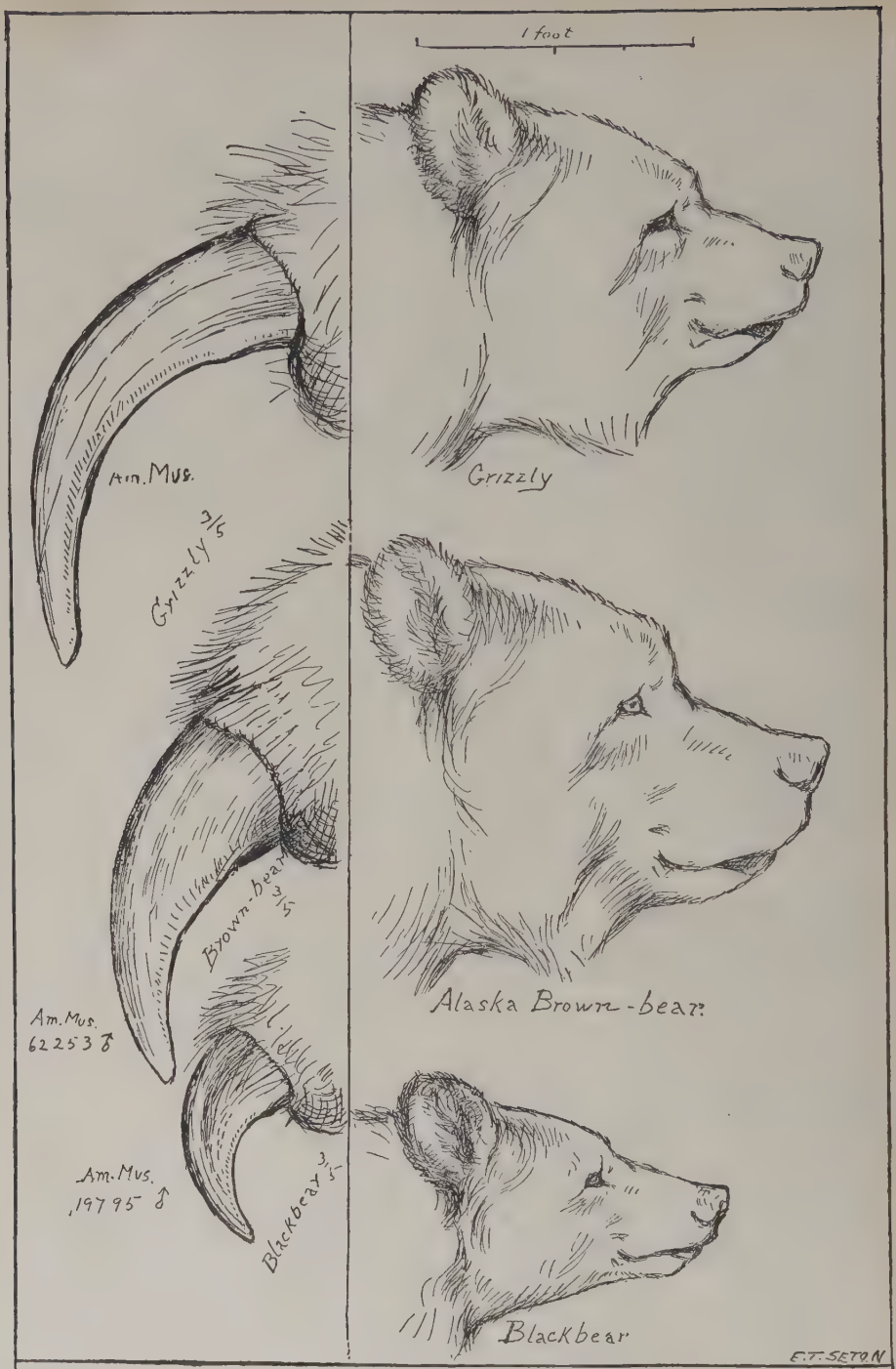


Plate II. ——— Claws and Profiles of Bears.

PLATE III.—GRIZZLY BEARS

I. London Zoo, 1925. II, III, IV, VI. Washington Zoo. V. Monarch, the Californian Grizzly, Golden Gate Park, San Francisco, 1907

PLATE IV.—ZOO STUDIES. GRIZZLIES AND KIN (NO. I IS RUSSIAN BEAR)

and north-central Alaska, all the large Bears are sufficiently near the Grizzly type, so that it is justifiable to speak of them collectively as Grizzlies. . . .

In addition to the Grizzlies, the Brown-bears, and their mixed relatives, one very peculiar Bear from the Mackenzie region has been discovered and given a special generic name, *Vetularctos*. It is very rare and has teeth of unusual charater.

The Grizzly in History

When Coronado marched from the City of Mexico through Arizona to the Seven Cities of Cibola (1540) and on to the Buffalo Plains of Texas and Kansas, he certainly saw many Grizzly-bears, but the only indication of the fact is in such vague and general phrases as the following:

"They have many animals—Bears, Tigers, Lions, Porcupines, and some Sheep as big as a Horse, with very large horns and little tails. I have seen some of their horns . . . and the paws of the Bears and the skins of the Wild Boars."[14]

To this, his Lieutenant Castenada adds: "There are large numbers of Bears in this province."[15]

As Blackbear and Cinnamon were more abundant than the Grizzlies, we cannot call any of these an early historical record for the species.

Baron Lahontan is commonly cited as the earliest recorder of the Grizzly-bear. His entire statement is as follows:

"The *Reddish Bears* are mischievous creatures, for they fall fiercely upon the Huntsmen, whereas the black ones fly from 'em. The former sort are less, and more nimble than the latter."[16]

Disregarding this very questionable record, the next and the first undoubted notice is by Edward Umfreville, who spent the winters 1784 to 1787 in the service of the Hudson's Bay Company, "on a large river which empties itself by many branches into" Lake Bourbon or Cedar Lake. "It comes from Stony Mountain [The Rockies]." That is, he wintered on the Saskatchewan and at Cumberland House, which had been built by Samuel Hearne in 1774, and was at that time the only inland post of the Hudson's Bay Company.

Umfreville's statement is as follows: "Bears are of three kinds: the Black, the Red, and the Grizzle Bear. The former is the least offensive, and, when taken young, the most docile and susceptible of kind usage.

"As to the other kinds, their nature is savage and ferocious, their power

[14] Coronado Exped., 14th Ann. Rep., Bur. Ethn., I, 1896, pp. 559–61.

[15] P. 518.

[16] New Voyages to North America, 1703, I, p. 234.

is dangerous, and their haunts to be guarded against. The numbers of maimed Indians to be seen in this country, exhibit a melancholy proof of their power over the human species. A Canadian last summer had his arm lacerated in a dreadful manner by one of these destructive animals: Yet if a man is mounted upon a good Horse, he may attack one with success; nor will they always fall on a person unprovoked.

"They feed upon berries, roots and flesh. In summer, they travel about, but in winter they live in a state of inanimation in some recess underground, and sustain nature by sucking their paws."[17]

It would be more correct to credit Hearne with being the first discoverer of the Grizzly-bear, for he ran across it when he was at Coppermine River in July, 1771. But he did not publish till 1795, so he loses the credit of his discovery, and Umfreville, though he came 15 years later and maybe got his information from Hearne, is thus allowed the honour because he happened to get 5 years ahead in his publication.

Nevertheless, the earliest undoubted record by a man who saw a specimen with his own eyes and made note of it, is in Samuel Hearne's famous "Journey to the Northern Ocean" during the years 1769–72. He says, July, 1771: "Brown Bears are, I believe, never found in the North-Indian territories; but I saw the skin of an enormous Grizzled Bear at the tents of the Esquimaux at the Copper River; and many of them are said to breed not very remote from that part."[18]

The next historian to note the Grizzly was Sir Alexander Mackenzie in his memorable canoe journey down the river which bears his name, to the Polar Sea and back up the Peace to the Pacific. He writes, May, 1793, when at lat. 56° 17′ 44″ north, on the Peace River: "We perceived along the river, tracks of large Bears, some of which were 9 inches wide and of proportionate length. We saw one of their dens, or winter quarters, called *Watee*, in an island, which was 10 feet deep, 5 feet high, and 6 feet wide; but we had not yet seen one of those animals. The Indians entertain great apprehension of this kind of Bear, which is called the Grisly Bear, and they never venture to attack it but in a party of at least 3 or 4."[19]

To this he adds:[20] "We this day saw 2 Grisly and hideous Bears."

Fourth but best place in this list must be given to the intrepid explorers, Lewis and Clark. Though fourth in strict chronology, it is usual to give

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[17] Present State of Hudson's Bay, 1790, pp. 167–68.

[18] Journey, 1795, pp. 371–72.

[19] Voyage, 1801, p. 160.

[20] P. 164.

them first and only mention, for their full and accurate account it was that called the world's attention to the fact that here was a new Bear.

On May 14, 1804, Capt. Merriweather Lewis and Capt. William Clark, with their 43 frontiersmen and picked hunters, left their winter quarters on Wood River, on the Mississippi opposite the Missouri mouth, to push westerly up the Missouri to the Pacific.

By Sept. 15, they had ascended the Missouri to the mouth of White River. They were now well within the range of the Grizzly, and Patrick Gass, their sergeant, in his Journal, says, Oct. 20, 1804, when just above the Cannon Ball River: "Our hunters came in, having killed 14 Deer, a Goat [Antelope] and a Wolf: and one of them wounded a large White Bear."[21]

But outside of this, these 45 famous hunters continued for eleven months hunting and travelling in the region abundantly affected by the Grizzly, covering 600 miles of travel, and never once did they definitely record having seen a Grizzly-bear, until they arrived at the mouth of the Yellowstone, Apr. 29, 1805.

Bears in abundance they saw, and from the indefinite text one must assume that they were Black and Brown. But their first clear-cut recognition of the Grizzly is as follows:

"*April 29, 1805.* Captain Lewis, who was on shore with one hunter, met about 8 o'clock two White Bears." One of these they secured. "He was a male, not quite full grown, and weighed about 300 pounds; the legs are somewhat longer than those of the Blackbear, and the talons and tusks much larger and longer. . . . Its colour is a yellowish brown, . . . the front of the fore legs near the feet is usually black.[22]

During the next month, their attention must have been focussed on the Great Bear, and we find in the *Journal* the following:

"*Saturday, 31st* [May, 1806]. Two men visited the Indian village, where they purchased a dressed Bear skin of a uniform pale reddish brown colour, which the Indians called *yackah* in contradistinction to *hohhost*, or the White Bear. This remark induced us to inquire more particularly into their opinions as to the several species of Bears; and we therefore produced all the skins of that animal which we had killed at this place, and also one very nearly white which we had purchased. The natives immediately classed the white, the deep and the pale grisly red, the grisly dark brown, in short, all those with the extremities of the hair of a white or frosty colour, without regard to the colour of the ground of the foil, under the name of *hohhost*. They assured us that they were all of the same species with the

[21]P. 52, 1811 ed.

[22]Exped., I, pp. 214–15.

White Bear; that they associated together, had longer nails than the others, and never climbed trees. On the other hand, the black skins, those which were black, with a number of entire white hairs intermixed, or with a white breast, the uniform bay, the brown, and light reddish brown, were ranged under the class *yackah*, and were said to resemble each other in being smaller, and having shorter nails than the White Bear, in climbing trees, and being so little vicious that they could be pursued with safety. This distinction of the Indians seems to be well founded, and we are inclined to believe:

"First, That the White or Grisly Bear of this neighbourhood form a distinct species, which moreover is the same with those of the same colour on the upper part of the Missouri, where the other species are not found.

"Second, That the black and reddish brown, etc., is a second species, equally distinct from the White Bear of this country as from the black Bear of the Atlantic and Pacific oceans, which two last seem to form only one species. The common Blackbear are indeed unknown in this country; for the Bear of which we are speaking, though in most respects similar, differs from it in having much finer, thicker, and longer hair, with a greater proportion of fur mixed with it, and also in having a variety of colours, while the common Blackbear has no intermixture or change of colour, but is of a uniform black."[23]

With these paragraphs before him it was that, in 1815, George Ord, of Philadelphia, described the Grizzly-bear, gave it the name *Ursus horribilis* and thus formally introduced it to zoölogical science.

Ancient Range

The original range of the Grizzly is shown on Map I. It is now, of course, greatly restricted. In the United States (1922) it is nearly exterminated. Yet we find a melancholy pleasure in fixing the boundaries of the monarch's ancient realm, contenting ourselves with notes that determine the outlines, assuming that all suitable territory within that line was held by the Grizzly in the bygone golden days of the West.

Black Hills. "Grizzly Bears are found there sometimes in bands like Buffalo. . . . Grizzly Bears are often found in the Bad Lands; we saw the fresh tracks of one at Sage Creek, but saw nothing more of him."[24]

Lower California. "The only record I have found of Bears in Lower

[23] Exped, II, pp. 321–22.

[24] Culbertson, Journal, 1950, pub., 1851, Smiths. Inst., p. 90.

California is the reference in Pattie's Narrative[25] to the presence of Grizzlies near Santa Catarina Mission in the Sierra Juarez."[26]

Manitoba and Dakota. The extreme northeastern corner of the Grizzly's range was Manitoba. This statement rests chiefly on the narrative of Alexander Henry, the nephew. He was an expert hunter and trapper, and a close observer. He was, moreover, well acquainted with the Grizzly-bear of the Mountains, and his account, especially in view of the supporting testimony, must be allowed full weight. In the year 1800, he built a trading post on the Red River at the mouth of the Park River in North Dakota, about 30 miles south of the International Boundary. The journal he kept of those times shows that Blackbear were extraordinarily numerous, and that Grizzlies were occasionally seen on Red River. In his journal for 1800 are these entries:

"*October 17.* . . . During my absence the hunter killed a large Grizzly-bear [Dr. Elliott Coues, the accomplished naturalist who edited Henry's Journal, identifies this as the *Ursus horribilis*] about a mile from the fort. He had seen two males and a female, but the latter escaped. My people, having cooked and eaten some of the flesh, were taken very ill, and most of them threw it up. This Bear had been wounded in the fore leg some time before by an arrow, the iron head of which stuck fast in the bone, and was beginning to rust. Grizzly-bears are not numerous along Red River, but more abundant in the Hair Hills [Pembina Mountains]. At Lac du Diable [Devil's Lake], which is about 30 leagues west, they are very common—I am told as common as the Blackbear is here, and very malicious. Near that lake runs a principal branch of Schian [Cheyenne] River, which is partially wooded. On the banks of this river I am informed they are also very numerous and seldom molested by the hunters, it being the frontier of the Sioux, where none can hunt in safety; so there they breed and multiply in security.

"*October 18.* . . . My hunter plagued me for a small keg of liquor, having vowed, on killing the Grizzly-bear, that he would make a feast of rum. This is a common custom among the Saulteurs, when they kill any uncommon animal."[27]

Again on page 145, he writes: On Cheyenne River "Grizzly-bears are to be seen in droves; and it may be called the nursery of Buffalo and Deer. It is a delightful country, but seldom can our Saulteurs kill a Beaver there without falling in with their enemies."

[25] Thwaite, 1905, p. 221.

[26] Nelson, Lower California, Nat. Acad. Sci., XVI, First Memoir, 1921, p. 110.

[27] Journal, 1897, p. 121.

Later, in his returns of fur from Lower Red River Department, 1800–01, Henry enters:[28]

	Black-bear	*Brown-bear*	*Grizzly-bear*
From Reed River (Roseau River), Man.	52	20	4
From Park River, Dak.	125	23	2

In the following year, though 152 Blackbear and 42 Brown-bear appear, there was but 1 Grizzly taken, and that was brought into Portage la Prairie, Man.[29]

In 1804–05, he records 10 Grizzlies; 4 from Hair Hills (Pembina Mountains), 4 from Salt River, 2 from Pembina River.[30]

In the season of 1805–06, the returns show 125 Black-bear, 49 Brown-bear, and 4 Grizzly-bear. Of these Grizzlies, 1 was taken at Portage la Prairie and 3 at Pembina River.[31] As the furs collected at each post were, for business reasons, classed separately with great care, there was little chance of importations to impair the scientific value of the list.

On August 29, 1808, Alexander Henry, writing at a point on the Saskatchewan some 60 miles below the Forks, that is, near W. Long. 104°, says: "Tracks of animals are very numerous along the beach, including those of Bears both of the Common and Grizzly species."[32]

Roderick MacFarlane writes: "Mr. Moberly, who spent several years in British Columbia, says that he was credibly informed that many years ago, Grizzly-bears were occasionally met with in the Pas Mountains of Cumberland [House] District, and amid the Touchwood Hills of Manitoba."[33]

These last two notes are of special interest as marking the probable northeasternmost extension of the Grizzly-bear. But its range began to shrink with that of the Buffalo that it preyed on, or both retreated before the mounted riflemen, who now began to appear.

In Brackenridge's time (1814), this Bear was "not usually seen lower than the Mandan Village [near Bismarck, N. Dak.]. In the vicinity of the Roche Jaune [Yellowstone] and of the Little Missouri [probably not the present Little Missouri], they are said to be most numerous."[34]

[28] Journal, p. 184.

[29] As above, p. 221.

[30] As above, p. 259.

[31] As above, p. 281.

[32] As above, p. 480.

[33] Mammals of Northern Canada, Through the Mackenzie Basin, Toronto, 1908, p. 216.

[34] H. M. Brackenridge, Views of Louisiana, 1814, p. 55.

In 1820, Richardson saw a Grizzly killed at Carlton House[35], on the Saskatchewan, and intimates that the species was well known to the Indians there, though not apparently farther east. He gives its range as "the Rocky Mountains and the plains lying to the eastward of them as far as Lat. 61° and perhaps still farther north,"[36] and as late as 1875 Colonel Dodge reports the species numerous in the Black Hills.[37]

Primitive Numbers

In ancient times, it was common to see a dozen of these monsters in a day's march. Old hunters say that in the spring of the year they would average that number per day.

Hittell, the historian, submits the following in his description of California in pioneer days:

"In early times Grizzly Bears were very plentiful all over the country and did great damage to the Cattle and gardens of the first settlers. In 1799 the troops of Pruisima made a regular campaign against the Bears of that region. In July, 1801, Raymundo Carrillo wrote from Monterey that the vaqueros in that neighbourhood had within the year killed 38 Bears, but that the depredations by others continued unabated; and he proposed an ambuscade by the troops at a certain place where the carcasses of a few old mares should be exposed."[38]

Bryant[39] records that Bidwell, in Rogers's "History of Colusa County," states that when the county was first settled, it was not uncommon to see 30 or 40 Grizzly-bears in one day.

Newberry, writing in 1857, asserts concerning the Grizzlies:[40] "They are rather unpleasantly abundant in many parts of the Coast Range, and Sierra Nevada, in California, where large numbers are annually killed by the hunters, and where not a few of the hunters are annually killed by the Bears."

John Muir visited the Yosemite Park first in 1875. It was then in primitive condition. He writes: "The number of Bears that make the park their home may be guessed by the number that have been killed by the two best hunters, Duncan and old David Brown. Duncan began to be

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[35] F. B. A., I, p. 25.

[36] As above, p. 28.

[37] The Black Hills, 1876, p. 122.

[38] History of Calif., II, 1898, pp. 560–61.

[39] Cal. F. & G., 1, 1915, p. 96.

[40] Pac. R. R. Reports, 1859, 6, Zoology, p. 47.

known as a Bear-killer about the year 1865. . . . In 9 years he had killed 49."[41]

Dr. J. C. Merrill says: "At that time [1877] Bears were plentiful. In the same month and near the same place, I saw 11 in one day, 2 Black and 9 Silver-tips, which I think was not far from the usual relative abundance of the two species in the Big Horn Mountains 15 and 20 years ago."[42]

W. Wells, the old-time hunter, says of the Grizzly: "To show how plentiful and bold Bears were at that time [1880], I saw 5 at the carcass at different times that afternoon, killed 1 of them, wounded another, and let the rest get away.

"Up to within a short time ago, a period so short that to many of us it seems but yesterday, the Bear was one of the animals most frequently seen in the mountains."[43]

Telling of his first Bear hunt near Spokane, Wash., late in the August of 1883, W. H. Wright says that he and his two friends broke every known rule of hunting during that week-end party. "Our inexperience in this kind of hunting, our lack of caution, and our carelessness in making too much noise, prevented us from getting any Grizzlies; and it spoke volumes for the number of these animals when roaming the hills that we actually, in spite of our awkwardness, saw 11."[44]

James M. Mackenzie of Bakersfield, Calif., told me, Oct. 6, 1899, that: "One day in June, 1885, on the foothills southwest of Bakersfield, I was out with my pard, Dave, and we saw 14 Bears rooting around all in sight at once. Close to me was an old Grizzly with 4 cubs. I shot her and then we got the cubs. Later we killed another old female Grizzly. None were large Bears."

In Sept., 1902, when I was camped on the Bear Creek of the Bitterroot Mountains, Idaho, my guide, Abe Leeds, said that in summer, during the salmon run, you would find a Bear, Black or Grizzly, on at least every 50 yards of this creek. There was at the time of my visit plenty of Bear sign, and our party saw 6 Grizzlies and a dozen Blackbear during one month. But, of course, they were at this season scattered among the berry patches, whereas in summer they are gathered along the spawning creeks.

Twenty years before, they had been much more plentiful.

In sudden contrast to all this evidence of abundance, we find the following by Capt. J. C. Fremont in his famous Journey across the Plains from the

[41] Yosemite, p. 619.

[42] Trail & Camp Fire, A Silver-tip Family, 1897, p. 227.

[43] Rocky Mt. Bears, p. 6.

[44] Grizzly Bear, p. 9.

Missouri River at the mouth of the Kansas, to Oregon in 1842. He was then in sight of Wind River Mountains on the Upper Sweetwater at N. Lat. 42° 32′ 30″, Long. 108° 30′ 13″. The date was August 3d.

"A Grizzly-bear—the only one we encountered during the journey—was seen scrambling up among the rocks."[45]

Number of Grizzlies in U. S. To-day

Dr. C. H. Merriam published in 1922 an estimate of the Grizzlies left in the United States at the time. This valuable article appeared in *Outdoor Life* for Dec., 1922, pp. 405–06. The map accompanying it has been incorporated with my own map.

In brief, there were then about 800 Grizzlies left, chiefly in Wyoming, Montana, and Colorado.

Horace M. Albright, Supt. of Yellowstone Park, writes me, May 12, 1925: "I believe there are between 60 and 100 Grizzly-bears in the Park at present, and I have seen as many as 21 Grizzlies at the garbage dump back of the Canyon Hotel at one time!"

Each year the number of hunters increases; each year more deadly traps, subtler poisons and more irresistible guns are out to get the Grizzly. He has no chance at all of escape. There is no closed season, no new invulnerability to meet the new perils. He is absolutely at the mercy of those who know no mercy; and before five years more, I expect to learn that there are no Grizzlies left in the United States, except in the Yellowstone Park, that last blessed haven of the fugitive from inevitable and nearly universal destruction.

In Canada and the Northwest

In Canada and Alaska things are not quite so bad. The map shows a shrinkage of range, and there can be no doubt that in many extensive areas the Grizzly is exterminated. But there are still enormous stretches of Grizzly country in practically primitive conditions.

In British Columbia, he holds out fairly well as yet. Not many years ago, W. H. Wright saw 21 there in a single spring trip.[46]

On May 26, 1910, the Honourable A. Bryan Williams, Provincial Game Warden of British Columbia, wrote to Col. G. O. Shields: "I know the country about Bella Coula personally, and have just returned from there. It is a most excellent Bear country, and there are many Grizzlies there during

[45] Explor. Exped., 1842, pub. 1845, p. 58.

[46] World's Work, Aug., 1905, p. 6540.

the salmon season, also in the spring. . . . The entire B. C. coast is good for Bear, but Grizzlies are more plentiful north of the Queen Charlotte Islands. Every long inlet is good for these Bears."[47]

Thomas Anderson, of Fort Smith, informed me in 1907, that a Grizzly was killed near Birch Hills in 1905, but they were then very scarce. However, they are still plentiful along Peace River.

On the Athabaska, according to Raymond Thompson, Bears are still abundant. He says: "Never before or since have I seen so much Bear sign in any locality of a like size; at first I was somewhat alarmed to think there were so many about. The first day I was there, I saw 7 Bears and never got a single shot. There were so many carcasses scattered up and down that valley that it was impossible to tell how many Bears there really were, but I honestly believe there were somewhere in the neighbourhood of a score.

"The second day I shot a small Black early in the morning, and saw a large Cinnamon late that evening."[48]

J. O. Curwood says: "During one season which I spent in the Frying Pan Mountains, gathering material for my 'Grizzly King,' I saw 27 Grizzlies, innumerable Blacks and hosts of other game. On my last trip, I spent 6 weeks and saw 3 Bears."[49]

Dr. C. F. Hardy gives in great detail an account of his recent hunting trip in northern British Columbia, not far from Mt. Robson. His party had good guides and rare luck, for he says: "Our total bag of game consisted of 4 Goats, 3 Sheep, 7 Bears (of which 5 were Grizzly), 4 Caribou, and 2 Moose, besides blue grouse, spruce hen and ptarmigan."[50]

In the Cassiar Mountains of British Columbia, also, it is refreshing to note that something like primitive conditions still pertain, if we may judge from the account given by Carleton Shaw. He had shot a big Cinnamon Grizzly and skinned him; then he says: "On my return back up the side of the mountain toward camp, I ran into a flock of Sheep, picked the biggest head, and killed him with one shot, which ranged through his hind quarters and out through his chest. After skinning the head, I left both to be packed in by the packer on the morrow. I arrived in camp about seven, and found Hyatt already there with a magnificent Sheep head measuring 40½ inches with a remarkable spread of 29 inches. After hearing his expe-

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[47] Shields Mag., Jan., 1911, p. 22.

[48] Grizzlies of the Athabaska, Forest & Stream, Aug., 1922, p. 343.

[49] Wild Life and Wild Fire, American Forestry, March, 1923, p. 143.

[50] Outer's Recreation, Jan., 1922, p. 73.

riences in bagging this fellow I asked him what he had been motioning about from the mountain top. He laughed and said: 'While you were skinning that Bear, I saw another one over about a quarter of a mile to your right, and another about the same distance to your left, and a big bull Moose below you, but just then we saw this flock of Sheep and had to beat it, or I would have come down and told you.'"

Then, at the call of the Indian guide, he says: "I took the glass and made out a huge pair of antlers looking like a large palmetto shrub among the alders. I handed the glasses back to Ned and whispered, 'We go.' Ned was scanning the surroundings again. 'No,' he whispered, 'look! One, two, three, four, five, six Moose. Cows and calf all around him. Beeg family. Stay here until he get up, maybe he come this way.' Minute after minute went by. Hour after hour. The big fellow lay still, the cows and calves fed quietly all about him. Twelve o'clock came and went, and then one. 'Lord, Ned, I can't sit here any longer. I'm froze. Let's go.' Ned was getting impatient too. We had decided that if he didn't move and we could crawl down a little ravine that we saw over to our left, we would be within range. Silently we rose, and stooping, crawled back up the mountain—once over we started on a run, for about where we thought the ravine started.

"Suddenly we bumped into a flock of 12 Goats, but we weren't after Goats and they paid no attention to us beyond staring as we passed."[51]

Going still northward, we find another haven, a haven saved by its remoteness and its rugged inaccessibility, in the southwest corner of Yukon Territory.

Major L. T. Burwash tells me that this region, especially about Lake Kluane, is still a wonderful game country. When he was there from 1902 to 1912, he saw as many as 15 and 20 Grizzlies in one day. There is no reason to believe that conditions have changed since.

In Alaska, things are not in so satisfactory a state. Regular steamers and a vast influx of miners have had the usual effect of annihilating a large proportion of the game. But there is a fair showing still, as is evidenced by these notes from the pen of Capt. Beverley W. Robinson:

"Several summers ago, two friends of mine had their camp on a big stream in southern Alaska during the height of the run of salmon up-river. . . .

"Hardly a day passed without one or more Bears being seen. . . .

"Six Grizzlies in all were killed before breaking camp, and though,

[51] Field & Stream, Feb., 1920, pp. 921–22.

with one exception, they were fine big specimens, yet, it being summer, their coats were in very poor condition."[52]

Home Range and Haunts

The range of the individual Grizzly varies greatly with local conditions. In a rugged mountainous region where food abounds, it will not go half-a-dozen miles from a central point. In the days when it followed the Buffalo herds, it probably went ten times as far, for, unlike the Blackbear, it is, or was, at home on the plains. But a typical Grizzly in ordinary mountain country to-day will ramble over a home-region at least 25 miles across.

W. H. Wright, after exceptional experiences, says: "The Grizzly will live his life in a restricted area. He will go but a few miles in any direction if there is food at hand, but he will seek the food he wants if it is 20 miles away. A Grizzly, however, nearly always selects a range where he will not have to travel very far to feed."[53]

The map shows that the Grizzly was essentially the Big Bear of the Mountains.

The ideal home of this animal is high rolling uplands, where dry, open prairies are interspersed with rocky ridges and densely wooded thickets. Here it finds food in abundance as well as sunning places and shady retreats in which it can wallow in mud and coolness, and defy alike the over-hot sun, the bot, the gnat, and the relentless mosquito.

Even in the days when it roved the wide plains, it was usually found in the bottom-lands and places that had a vestige of cover rather than bold and bull-like on the level open.

It may visit, but it never stays long on bleak mountains above timber-line. It is not contented on broad level wastes that are without cover or water. It is not happy in a big swamp where the footing is everywhere wet. Otherwise, it may be, or once might have been, looked for in all parts of its vast range where there are food, water, and shelter.

In general, the Grizzly's habits resemble those of the Blackbear. Both are shy, but desperate fighters when cornered. Both are lovers of the twilight, but travel in full day or black night on occasions. They differ in this: the Blackbear rarely quits the woods; the Grizzly often lives permanently in the open country.

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[52] Forest & Stream, June, 1924, pp. 335, 370, 371.

[53] World's Work, Aug., 1905, p. 6540.

Food, Fish, Etc.

Anything that any four-foot will eat, we are safe to assume that the Grizzly will consider food, be it grass, roots, berries, nuts, insects, honey, snakes, frogs, fish, birds, eggs, animals small or large from Mice to Sheep and Cattle—yea, even though they have reached the potent stage called carrion.

Wells says of the Grizzly's earliest seasonal diet: "As vegetation starts, Bears live almost altogether on grass, roots, etc., though, of course, they will often eat meat. Still, I have had baits right among the Bears, with Bears passing within 50 feet of the baits every night, and it was the middle of June before one of them touched a bait, and then they were at the baits all the time."[54]

John Muir, with his usual happy way of discanting on the doings of his beloved animals, thus describes the food of the "Sequoia" of the beasts: "In this happy land [the Yosemite] no famine comes nigh him. All the year round, his bread is sure, for some of the thousand kinds that he likes are always in season and accessible, ranged on the shelves of the mountains like stores in a pantry. From one to another, from climate to climate, up and down he climbs, feasting on each in turn—enjoying as great variety as if he travelled to far-off countries north and south.

"To him almost everything is food, except granite. Every tree helps to feed him, every bush and herb, with fruits and flowers, leaves and bark; and all the animals he can catch—Badgers, Gophers, Ground-squirrels, lizards, snakes, etc., and ants, bees, wasps, old and young, together with their eggs and larvæ and nests. Craunched and hashed, down all go to his marvellous stomach, and vanish as if cast into a fire. What digestion! A Sheep or a wounded Deer or a Pig he eats warm, about as quickly as a boy eats a buttered muffin; or should the meat be a month old, it still is welcomed with tremendous relish. After so gross a meal as this, perhaps the next will be strawberries and clover, or raspberries with mushrooms and nuts, or puckery acorns and chokecherries. And as if fearing that anything eatable in all his dominions should escape being eaten, he breaks into cabins to look after sugar, dried apples, bacon, etc. Occasionally he eats the mountaineer's bed [of skins]; but when he has had a full meal of more tempting dainties he usually leaves it undisturbed, though he has been known to drag it up through a hole in the roof, carry it to the foot of a tree, and lie down on it to enjoy a siesta.

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[54] Rocky Mt. Bears, p. 6.

"Eating everything, never is he himself eaten except by man, and only man is an enemy to be feared."[55]

Similar testimony is given me by Mackenzie of Bakersfield. He says: "In spring, Bears feed on red clover and alfalaria, purple flower grass. Later they feed on berries, elder berries, manzanita berries, dogwood berries, and are happy when they can find and a rob a bee tree."

In the summer, farther north, and out on the open prairie, the Grizzly is said to feed largely on the prairie-turnip (*Psoralea esculenta*) alternated with Ground-squirrels, Gophers, and other products of the soil.

For procuring these, its armed feet are a perfect combination of crane and crowbar, pick and shovel, rake and forceps. Like the Elephant's trunk, their mighty force in heaving a huge log or boulder is only equalled by their manual dexterity in picking up eatable mites. I have seen a Grizzly use two claws to pick up small objects, exactly as a Chinaman might use his chop-sticks. I have noticed, further, that it never uses two claws when one will better serve.

But his mainstay along the big rivers of the Western slope is the salmon that swim in their marvellous hordes in nearly all that pour their flood into the Pacific Ocean.

W. H. Wright says that the Grizzly usually catches the salmon in the shallow riffles, but "sometimes a Bear will sit on a log jam and watch for the fish to swim out from under the logs. When one comes, he will, with a sweep of his paw, send it flying to the bank. I have often seen them fishing in this way, lying on a log with one paw hanging in the water, and it is wonderful how many salmon they will fling out. Once I saw 5 old Grizzlies fishing from one log jam."[56]

Sometimes the fish on the bank got "high" before they were needed, but this, it seems, did not disqualify them as Grizzly food. Now, this is loathsome if we call those fish "carrion," but—so much is there in a word that it becomes quite all right—of acceptable good form if we say they were "gamey." Which remark is a proper prelude, an explanation and justification of the next array of facts.

Lew Wilmot, the well-known sportsman, says: "In 1860, while I was working in Georgia Gulch, Colo., in the month of August, a Cayuse died in the main road about one mile from the camp. It was not long before the odour was so terrible that it was hard to get by the carcass. It had reached that stage of putrefaction when the maggots ran down the road for at least 40 feet.

[55] Yosemite, p. 617.

[56] Grizzly Bear, pp. 69–71.

"One evening I was returning from work. I had formed the habit of turning off about 100 yards before I got to the carcass and keeping to the foot of the mountain to keep away from the smell as much as possible. I had got opposite the carcass, when, looking at it, I saw an old Grizzly-bear and 2 cubs engaged in licking up the maggots as fast as they could. I shouted at them and they stopped, looked up, and after a few seconds, the old Bear whistled, and all three ran off. Since then, I have never been able to eat a piece of Bear meat."[57]

"The Grizzly," says Wright, "usually goes into winter quarters among the rocks, at a much higher altitude than does the Blackbear, and as hibernating rodents are the only food he can find along the high peaks and ridges, he devotes much time, at this season of the year, to digging them out and devouring them. Throughout the Bitter Root Mountains, and in the Selkirks of British Columbia, the last food that the Grizzly obtains before denning up are the Hoary or Whistling Marmots, and the little animals commonly called Gophers, but which, properly speaking, are Columbian Ground-squirrels."[58]

But these observations present the Grizzly as he was in primeval days. The coming of the white man with his flocks of Sheep and herds of Cattle have made a far-reaching change in all his habits. Deer and Buffalo in the form of carrion, he always did eat, but the creatures themselves he did not kill because he could not catch them. However, Sheep and Cattle are of slower, stupider breed, and this led in sundry cases and diverse regions to the making of the Sheep-killing and Cattle-killing Grizzly.

Sheep-killer

The Sheep-killing Grizzly was confined to the far Southwest, for the sufficient reason that Sheep were not elsewhere introduced, except in unimportant numbers.

John Muir's account of a Sheep-killer raiding a flock may win applause from those who have seen vast areas of God's country devastated by the "hoofed locusts," but it will reach the Sheep-man's heart with a thrill of horror.

"On the night I spent at their [the shepherds'] camp, the show made by the wall of fire when it was blazing in its prime was magnificent; the illumined trees round about relieved against solid darkness, and the 2,000 Sheep lying down in one gray mass, sprinkled with gloriously brilliant gems,

[57] Forest & Stream, Feb. 26, 1910, p. 334.

[58] Grizzly Bear, p. 79.

the effect of the firelight in their eyes. It was nearly midnight when a pair of the freebooters arrived. They walked boldly through a gap in the fire circle, killed 2 Sheep, carried them out, and vanished in the dark woods, leaving 10 dead in a pile, trampled down and smothered against the corral fence; while the scared watcher in the tree did not fire a single shot, saying he would hit some of the Sheep, as the Bears got among them before he could get a good sight.

"In the morning I asked the shepherds why they did not move the flock to a new pasture. 'Oh, no use,' cried Antone. 'Look my dead Sheeps. We move three four times before, all the same Bear come by the track. No use. To-morrow we go home below. Look my dead Sheeps. Soon all dead.'"[59]

I dare not express my own reaction to such a tale. I am not a Sheep-owner and I do not love Sheep. My sympathies are all with the Forests—and the Bear.

As Cattle-killer

The Cattle-killing Grizzly is the lineal descendant and natural heir of the Buffalo-killer. But he has an easier job, for a range steer is a light matter compared with an old Buffalo bull. Nevertheless, the Grizzly could, and did, kill the latter. A cow or yearling heifer of the range breed must be a passing amusement.

Some individuals are much more given to meat diet than others, and such have become veritable nuisances on the Cattle range near their head-quarters.

Cattle-killing Grizzlies are rare now, but undoubtedly they still exist. The following instances related to me by Edward C. Russell, attorney, of Helena, Mont., shed interesting light on their habits:

About 1880, Grizzlies were very numerous in the country some 60 miles south of Helena. They used to come in there for the berries, but would occasionally kill Cattle. When a beef was thus killed, Russell used to sit up over it in a tree.

One night a large Silver-tip came to the carcass. The watcher was 10 feet up a small cotton-wood. The Bear smelt him and came sniffing up the wind to find him, but each time lost the trace as he got near. The scent seemed to go over his head. Several times this happened. Then, in determination to find his foe, he began to break down the brush around. He would smash down a thicket with great uproar and then remain as still as

[59] Yosemite, pp. 621–22.

Young Grizzlies, 3 months old; born in Golden Gate Park, San Francisco. The offspring of Monarch

Life studies of Grizzly paws

PLATE V.—GRIZZLY CUBS AND DETAILS

death to see if the man was flushed; then another, and again a wait. Sometimes he would wait for three or four minutes without a move. In this way he flattened all the brush for an acre about the hunter and the carcass, but the night was so dark that there was no opportunity for a shot.

Another time a cow was killed by a Grizzly, dragged halfway across the river, and then left lying in the water; fifty yards away was a high cut-bank covered with brush. It was not on the usual trail of the Bears, and as they could not climb up the face, Russell decided to hide there and shoot from it. On getting ready to go, however, he found that he had but one cartridge, and so gave up the attempt. Next morning he learned that the Grizzly had come, but before feasting was careful to break down all the brush on this commanding point, so that had the man been there, he would certainly have fallen into the power of the Bear.

Grizzly Adams has shed some red and brilliant light on the methods of a Cattle-killer on the Plains of the San Joaquin in the stirring '50's:

"About sundown," he says, "I heard a tremendous commotion among the Cattle, and, going out to see what caused it, beheld a huge Grizzly-bear rolling and tumbling in the grass, while the Cattle were gathering around him and bawling as if crazy."

At last, a young cow made a rush at the Bear. She was promptly seized, and her throat torn open. The rest of the details may be found on pages 315–17 of Adams's book.

That the Cattle-killers are not entirely gone is too well known to the ranchmen in the West. One of the most noted has recently fallen to the rifle of a government hunter.[60] The story presented in the colourless form of a Departmental Report is nevertheless full of wild-life interest. It reads as follows:

"One notable kill was made in the Okanogan Forest Reserve in Washington. This Bear, a Grizzly, had been responsible for heavy losses during the past three years, and was definitely known to have killed 35 head of Cattle and 150 head of Sheep during the summer of 1923. The latter part of July [1924] it appeared near a camp after dusk and attacked a 4-year-old steer. Hearing the noise, the camp foreman investigated and found the Grizzly holding the steer with its fore feet and biting at its neck. A shot failed to take effect and the Bear ran away. At the request of livestock owners, an experienced hunter with trained Dogs was assigned to the task and effected the capture of this notorious animal, in about three weeks. This Bear weighed over 1,100 pounds."[61]

[60] Biological Survey.

[61] Ann. Rep., Dept. Agri., 1924, p. 8.

His Cache

As a fitting finish to the section on food is a paragraph on the food cache. Most animals whose food is subject to vast and seasonal variation, develop the thrifty habit of storing up surplus food for a time of want. The Grizzly is one of these, though his notion of want is rarely more than two or three days ahead.

All animals with the storage habit have some way of marking their cache, putting on it their property mark.

The Wolverine may mark his cache with his anal ointment, the Fox uses his protometric musk for the same purpose, and the Mountain Lion piles brush on his, but the old Grizzly uses fresh clean earth.

As Jack Monroe said to Emerson Hough when they found that an old Grizzly had buried their Horse-for-bait:

"Jack took a quick glance, then uttered a suppressed yell. 'He's been there!' said he. 'Look—he's been rooting grass and stuff up along the neck of the Horse.'

"I looked closely, and sure enough, that was true.

"'That means he's coming back,' said Jack. 'That's his brand on that Horse. A Mountain Lion will carry a Deer off and cover it up with brush—that means it's his meat. If a Bear comes along and roots dirt up alongside a carcass, that's his way of saying, 'This is my meat, and you let it alone: I'll come back when I get around to it.'"

"'But will he?' said I. 'If so, when?'

"'I don't know,' said Jack. 'Nobody can tell. Maybe to-morrow, maybe two or three days. But he's pretty sure to come back some time, because he's claimed this meat.'"[62]

His Hide and His Meat

The hide of the Grizzly never had an important place in commerce. Most of the mountaineers who achieved ownership of such a trophy, fell in with the tradition that considers them merely the foundation of a comfortable bed in the cabin bunk.

I have more than once seen the dried flat hide used as the door to an Indian teepee, and the very first one seen and reported by a white man was probably used in this very way.

In the early days, Grizzly and Blackbear pelts were lumped together as Bear skins. Now that the Grizzly is understood and vanishing, his hide has acquired a new value and esteem. It is dressed and made up as a rug

[62] Field & Stream, Nov., 1919, p. 654.

with head and claws. As such, the skin that used to fetch $5 at best, can now command $150.

Men do not eat Tiger or Lion flesh. It is assumed to be bad because the creatures are flesh-eaters, and yet most evidences ascribe rare virtues to the meat of the Bears, Black and Grizzly, provided always that it is properly taken and prepared.

John Muir says that his old hunter friend, David Brown, was very emphatic on the subject. "Bear meat is the best meat in the mountains; their skins make the best beds, and their grease the best butter. Biscuit shortened with B'ar grease goes as far as beans; a man will walk all day on a couple of them biscuit."[63]

Mating Season

Grizzly-bears mate in midsummer. On the Missouri, the mating season is indicated by the following note in Lewis & Clark's Journal: "*June 15.* The Brown and Grizzly Bear began to copulate."[64]

A pair of Grizzlies in the Central Park Zoo, New York, mated in July. The old Grizzly (Monarch) at Golden Gate Park, San Francisco, and his wife consummated their union on June 19, 1904.

Dr. John Richardson tells of his assistant, Thomas Drummond, who made a side trip into the Rockies at the Athabaska headwaters, and there met with many Grizzlies.

"In the latter end of June, 1826," says Richardson, "he observed a male caressing a female, and soon afterwards they both came towards him, but whether accidentally, or for the purpose of attacking him, he was uncertain. He ascended a tree, and as the female drew near, fired at and mortally wounded her. She uttered a few loud screams, which threw the male into a furious rage, and he reared up against the trunk of the tree in which Mr. Drummond was seated, but never attempted to ascend it. The female, in the meanwhile, retiring to a short distance, lay down, and as the male was proceeding to join her, Mr. Drummond shot him also. From the size of their teeth and claws, he judged them to be about 4 years old."[65]

Lady Washington, Grizzly Adams's tame Bear, must have been three, or perhaps four, years old, when a most romantic affair took place. They were camped in the Rockies, not far from Salt Lake City, in the month of

[63] Yosemite, p. 167.

[64] Appendix, p. 538.

[65] F. B. A., I, p. 28.

July, when they found that the she-Bear was being visited nightly by a big, burly lover of her own kind.

It speaks well for Adams that he forbade his men to shoot, and says: "For what I know, he still roams in his native haunts."[66]

In due time, she became the mother of a little cub that they named Fremont, who grew up to be one of their travelling company, These things are briefly touched on in Adams's story.[67]

But, alas! he omitted a hundred valuable details that no one since has had a chance to observe.

Little is known of Grizzly marriage customs in a state of nature, but it is generally conceded that they are not promiscuous, that one male mates with one female, that they continue together for a month or more, then part for good. It is very doubtful whether any of the sex feeling persists after the waning of the honeymoon. The pair, if they meet again that year, may accept each other as friends, but not as mates. Whether they reunite on the next breeding season, is utterly unknown.

Den and Sanitation

A Grizzly den which he found in central California, is thus described by Grizzly Adams. It was among the chaparral in a cañon—a hollow dug by the Bear herself. The entering tunnel was 3 or 4 feet in diameter and 6 or 10 feet long, where it ended in a rounded chamber or den, which was thickly carpeted with leaves and grass.[68]

James M. Mackenzie, of Bakersfield, Calif., tells me that he also has found many Grizzly dens. He confirms the above description, and adds that he never found one with any dung in it. On the feeding grounds, the Bears drop the dung anywhere, as do Cattle, but in or near the den, they are careful to bury it.

In Colorado, I found a certain fly pupating in the Grizzly's dung. Whether at one stage this fly inhabited the Grizzly's intestines, I do not know. These maggots may or may not have been a disease.

Winter Denning

In a large part of its range in the south, the Grizzly does not hibernate, that is, make a winter den in which to doze away the bad-weather time. This means that probably in these regions, he never dens up at all, and the female only when she must do so to care for the cubs.

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[66] F. B. A., I, Pp. 279–80.

[67] Pp. 304–05.

[68] Grizzly Adams, pp. 191–193, 240.

According to Mackenzie, if a Bear dens, he goes in about January 1st and comes out about February 15th.

In the northland of frost and snow, it is different. There both males and females den up, but, like the Blackbear, the Grizzly does not den up any sooner than he can help; that is, he roams the range as long as he can find food, and the males remain active longer than the females.

William Wells writes: "Bears go into winter quarters when the first heavy snows and cold weather begin, which is usually in November in the Rockies. In the old days they would den up right in open country. A Bear's winter den is nearly always on a north hillside, where the snow falls deepest, and if possible they choose a place where a drift will form. Sometimes a Bear will den up in a natural cave or crevice, but more often will dig himself a hole 10 or 12 feet deep. Nowadays this den is almost always in the roughest country he can find, and is generally pretty well up in the mountains in heavy spruce timber. A Bear may make his den early in the season, but until cold weather drives him in, he roams around a lot. For nearly a month before denning, Bears eat very little, or not at all, and before they go in for good, the stomach and intestines are frequently clean and empty. The stomach is drawn up into a solid lump like a chicken's gizzard, and the Bear is a solid mass of fat, inside and out. Along in February or March, when Bruin comes out again, he is still hog-fat, and he keeps this fat until the snow is pretty well gone. When he first comes out, he does not travel much, but as the weather warms up, he soon runs off all his fat, though I have seen very fat Bears as late as the middle of May, after the trees were green."[69]

Wright states that the Grizzly may sleep "until May, a month or six weeks after the Blackbear is out. At first, he does not go far from his den, but, after a few days, he starts for the side hills, where the snowslides have swept the snow away and where he can get a few mouthfuls of grass. It takes him about a week to get up his 'camp appetite,' and then things hum."[70]

Gestation and Borning

In the case of the Grizzlies which lived in Central Park Zoo, New York City, as already noted, the mating took place in July, and the gestation lasted a little over 6 months; in the Golden Gate pair, 6 months and 4 days. This, strange to say, is a month less than in the Blackbear, and may be modified by shorter hibernation in the Grizzly.

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[69] Rocky Mt. Bears, p. 6.

[70] Five Grizzlies.

My notes on the first are as follows:

New York, January, 17, 1901. The male Grizzly in the Central Park Zoo was brought here in 1891; the female in 1884. Both were full grown when they came. Two years ago, they produced a cub. Last year again they mated in July, uniting many times. To-day, about 11.20 A. M., a young one, a female, was born. (Whether there were others is not known.) It weighs $1\frac{1}{2}$ pounds, is $8\frac{1}{2}$ inches long (216 mm.) from tip of tail to end of nose. It is blind, and will continue so for 9 or 10 days. The Blackbear's young, strange to say, do not open their eyes till the 40th day. It is apparently naked, but covered with a very fine, short, gray hair, and is of a pale pink or flesh tint. The ears are low and the openings not yet visible. It squeals like a child when it is hungry, and is very restless, nosing about, falling on its back, and screaming in temper. It began to suck its Dog foster-mother at 1 P. M., when 1 hour and 40 minutes old. The little one had all the form of a Grizzly—the shape of head, the hump on shoulders, the paws, the lower jaw. The tail, however, was proportionally too long for the adult. The mother had been carrying it about in her mouth. It was somewhat scratched and bruised by her teeth. Of this I made several sketches. It died a few days later.

The second case was in San Francisco. On June 19, 1904, Monarch, the old Californian Grizzly at the Golden Gate Park, united with a female Rocky Mountain Grizzly. On December 23 (6 months and 4 days later), 2 little cubs were born in the cage. They were kept hidden by the mother for several weeks. They are now (March 18th) nearly 3 months old and about a foot high at the shoulder. They weigh, I should think, 12 or 15 pounds, are very pretty and playful. Their ground colour is gray, with dark ears, feet, and patch around eyes. Already they eat meat, fruit, bread, etc. Their mother is very careful of them. She seemed unwilling to let them go out of the den, but they got past her, and she followed. As we fed them, it came on to rain very heavily and suddenly; at the same time a loud slam of the bars alarmed her. At once she raked and cuffed the two young ones *under her body*, then, straddling very wide, sheltered them from the rain and guided them back into the den. She often uttered a sort of choppy coughing sound to them.

Sometimes the little ones put their paws through the cage to their father. He would sniff at the paws very loudly and utter a sort of quick, short "*koff, koff, koff, koff.*" It was not a menace, as he offered them no harm, though he had ample opportunity. At any sudden alarm, the old mother reared up on her hind quarters to look around.

The young commonly number 2, rarely 3, but 4 have been noted in one or two extraordinary cases.

Ordinarily, they are born in the mother's winter den, exactly as described in the Blackbear. They are suckled all winter in the den, but begin to eat solid food as soon as they can get it; that is, after they have begun active life in the spring.

The Devoted Mother

The proudest moment in the life of an animal keeper is when he can show a happy, healthy family born and rearing among the creatures in his charge.

To-day (April 9, 1925), W. H. Blackburn, of Washington Zoo, took me to see the new family of Bears there, four little cubs born to one Russian Bear. They are now 9 weeks old, and just beginning to go about with the mother.

She moved her ponderous limbs and body with the utmost caution to avoid crushing the active, heedless little Teddy Bears. They seemed to swarm about her.

They kept up a continual whimpering, and tried by every means to reach her body, and nurse. They stood on their hind legs. They clung to her limbs; they tugged at her coat; they boxed each other's ears, and tumbled, snarling and wrestling about on the floor. They loudly and louder wailed in good and ursine terms: "We are hungry, Mamma, Mamma, we are hungry!"

At last she consented, slowly, cautiously selecting a spot not littered over with cubs. She squatted, made a lap into which all rushed. Then she leaned slowly backward till her broad shoulders touched the floor. The litter of little woolly pigs snarled and quarrelled with each other, slapped each other's faces, boxed each other's ears, and nipped each other's behinds; shrieked: "Here, this is my place; I found it first." "'Tisn't, it's mine! Get a place of your own!" They whimpered even when each was attached to a nipple. But all got places. One, who had the two groin teats, kept changing from one to the other in his greedy, mumbling eagerness. The other three fastened on her breast where there are four nipples. They eagerly worked for their sustenence. Their whimpers died away as they contentedly snuggled and fed, while Mother Bear looked on with a wondrous beatific expression of joy. The only sound she uttered was a soft, low 'sigh' from time to time, a sound of joy, I think. From the grim old animal visage it came—a visage lighted up with a wonderful something—the blessed, holy light of a deep, a conscious, a joyful maternity.

Grizzly Adams tells of watching a den, as has already been described, and of shooting the old she-Bear as she faced him. Then he entered the den and found two cubs. One of these he gave to his partner, the other he kept and raised. This one he named "Ben Franklin," the Bear that followed him in his wanderings for years afterward, and responded to his loving care by tireless, doglike devotion.

The killing of Lady Washington's mother and capture of the twins by Adams, gives another vivid picture of young Bear life. In this case, the cubs were yearlings. He had shot their mother, but the two yearling cubs escaped into the woods and disappeared.

After a couple of days, Adams and his comrades found that they had come back, and were clinging to the dead body of their mother. The men lassoed the cubs and, by degrees, tamed them; so that one, Lady Washington, became his camping comrade.

Dr. J. C. Merrill, a trained observer as well as a keen hunter, had the rare privilege of watching a Silver-tip family for over a week in the Bighorn Mountains during the late '70's. He had, moreover, the wisdom to make the most of the opportunity without using a gun, and writes: "The chief occupation of the Bears while in sight was turning over stones in search of insects beneath, and it was most interesting to watch their methods. A man turning over a stone usually draws it over directly toward himself, to the imminent danger of his toes; but a Bear knows better than that. In the case of a heavy stone, they would brace themselves with one fore leg and with the other raise the stone and give it an outward sweep well to one side, so that it would not strike them in falling. The moment the stone was over, their heads went down, and they apparently licked up such insects as were in sight, though I was not near enough actually to see this. Then usually one or two rapid sweeps of a paw were made, probably to uncover such insects as might have secreted themselves. One of the cubs would sometimes join the mother in this search, but generally each worked independently. Imitating their mode of search, I have found many beetles and ants, and numbers of mole crickets, and of the large stone cricket (*Anabrus*). In this place, at least, dead stumps were rarely searched.

"The habit of turning over stones is very general in the spring and early summer, and was one of the best indications of the presence of Bears; later in the season, wild plums and other fruits are more generally sought as food. This family of Bears were regular in their habits, feeding from early morning till about 9 o'clock, and reappearing about 4 in the afternoon. On cloudy or showery days, they might be seen at intervals all day, but a hard rain they avoided. The female, while watchful, was not at all shy.

She happened to be in sight when the tents were pitched, a process she watched with much apparent interest and some surprise. At first she brought her cubs in close to her; but before long they resumed their search for insects, and finding they were not molested, paid little more attention to us. When watching an object, she would raise herself to her full height on her hind legs and elevate her head which was moved slowly from side to side, giving her a rather uncanny look of mingled watchfulness and waggishness; at such times she appeared to be making up her mind whether to sneak off, to charge, or to dance! This is a common attitude and one which I have frequently observed when hunting. The effect is of a pretty direct line from nose to rump in contrast with the usual outline of the Bear on all fours, where the shoulders are highest and the head and rump lowest. This attitude has something comical about it, and when seen assures the hunter that the animal is alert.

"I watched this interesting family for about a week, and left them undisturbed until autumn."[71]

Reference to the Blackbear Life shows the amazing extent to which the mother Bear resorts to corporal punishment to secure obedience. All Bears spank their young when it seems necessary.

James M. Mackenzie told me that he "once came on a she-Bear. Her cubs were up a tree. We were in pack train crossing a mountain stream. She chattered to them to come down. As soon as they came, she spanked them out of sight, over 200 yards. They squealed every time she hit them."

Some Bears, like some human mothers, are prone to spank the children merely because they themselves have lost their wits. The following by Capt. Beverley W. Robinson was clearly a case in point: An old Grizzly with her one well-grown cub, had ventured within the danger zone of his camp in the northern Rockies. "When within fair range, the old lady got a soft-nosed bullet high up in the ribs and too far back, whereupon, with a savage bawl, she waltzed over to the young Bear and gave him a left hook that sent him spinning, then, scenting some other presence, put for the fringe of bushes at her best pace. She, however, had to cross about 50 yards of open rocky shore and before reaching cover, another shot doubled her up."[72]

A curious case of cub disobedience and mother-Bear love is supplied by Will C. Barnes. Ranger Ray and Forest Supervisor Peck of the Routt National Forest in Colorado, ran on to a mother Grizzly and three cubs. Two cubs followed mother and were led safely away, but one knew better

[71] A Silver-tip Family by Dr. J. C. Merrill in Trail & Camp-fire, 1897, pp. 227–29.

[72] Forest & Stream, June, 1924, p. 370.

than mother and climbed a tree. The men caught him, tied him in a sack, and galloped away 7 or 8 miles to the ranch of Fred Alispaw, a man much interested in animals.

"Alispaw received the two forest officers with open arms. A heavy collar was placed about the cub's neck and one of the chains fastened to it. Then the cub was pushed into the old cage, the chain passed out through the bars, and fastened to a stout post so the door could be opened and the cub let out of the cage during the day for handling. The cage was placed at some distance from the cabin under a tree. That night, however, old Mamma Bear paid the ranch a visit, whipped a whole pack of Dogs, tore that fancy circus cage to bits, broke the chain in two as if it were a cotton string, and, followed by her offspring, left for parts unknown. Neither of them was ever seen again.

"The interesting fact is that, although the cub was carried several miles in a heavy sack on the back of a Horse, the mother was able to follow and rescue him. Was it that wonderful nose of hers, the instinct such animals possess, or did the youngster send out a frantic call for maternal help over some animal radio system which his anxious parent picked up with her keen ears?"[73]

The following curious observations show that the cubs are quick enough to recognize and cling to the mother's furry hide, but apparently have no scruples about devouring her dead body.

Behaviour of Wild Grizzly Cubs

(Contributed by a Member of the Zoological Society)

Last May, when I was out Bear hunting in the Rocky Mountains, one of our party shot a female Grizzly with 3 cubs. We had no Dogs, as they are not allowed in Bear hunting in Wyoming, so the cubs escaped. We skinned the mother and left the carcass lying where she fell, hoping the cubs would return on that account, but, though we visited it every day, we found no trace of them for about 3 weeks.

Then the warm weather came and the carcass ripened and the 3 little cubs returned to feed upon it. We tried to rope them several times, but they were so very small and so very quick and the trees so dense that this proved futile, but we eventually caught one in a trap made out of a box. He was quite fierce, but after his paws were tied together and a stick and rope put through his mouth for a gag, he became fairly docile.

He travelled quietly on the back of a Horse for several hours until, as

[73] W. C. Barnes, B'ar Stories, Sat. Eve. Post, Dec. 6, 1924, p. 158.

we reached camp, he started squealing and struggling violently, and upon being released, made a dash, pulling after him the men who were holding him, towards the 4 Bear hides we had strung on a rope near the tents. Still crying, he jumped upon that of his mother, and clung to it with his teeth and claws so firmly that we could only remove him eventually by hitting him gently but decidedly over the head with a stick.

About a week later, we caught one of the other cubs, a little female, and exactly the same performance was repeated. We kept them in camp about two weeks, and their only happy moments were when clinging contentedly to, or cuddled up upon, their mother's hide—the hide of the mother they had eaten with so much pleasure and appetite—where they would spend quiet, peaceful hours every day. As soon as taken away, they would cry and fight, even when taken half a mile from the camp so that we could sleep at night, and no amount of food and kindness were ever able to tame them. We endeavoured many times to make them pay some attention to the other Bear hides we had, but with no success whatever.[74]

A pleasing glimpse of Grizzly home life in far-away Alaska is afforded by Merle F. Bancroft's experiences. It shows how the Bears, like the Caribou and other northern creatures, turn the snow patches to account in hot weather:

"It was on one of these large snow patches," he says, "that we spied the Bear family as our trail brought around the crest of a low ridge. Two yearling cubs not far away were boxing and tumbling around on the snow. We stopped to watch them, for we were quite uncertain whether they were playing or quarrelling. We soon spied the mother Bear, an immense animal stretched full length on the snow napping or taking a sun bath. The young Bears rambled down on the snow and began to frisk around and over their mother. The old Bear raised her head and assumed the attitude of a big Dog reclining in an attentive position. It was plain that those young Bears could grow a great deal more before they would be as big as their mother."[75]

Grizzly Adams was more of a naturalist than most of the hunters of his day. He had deep appreciation of the beauties of nature, as is evidenced by his story, and was a lover of animal life, and yet, like all of his day, he had no scruples about slaughter of the kind detailed in another of his Bear family tales. He felt the old urge to go hunting Grizzlies, and says he "presently came upon an old Bear playing with two cubs in a pool. She

[74] Zoological Society Bulletin, Jan., 1918, p. 157.

[75] Can. Field Nat., May, 1922, p. 89.

would poke one in the water with her paw, and then the other, and, as they jumped back towards her, she would poke them off again—presenting thus an interesting and beautiful sight; for what can be more interesting or beautiful, among animals as well as among human beings, than to see a mother playing with her offspring?

"I looked a considerable time upon the scene, and did not fire till she appeared about ready to withdraw, when, as it happened, I merely broke her shoulder. She rushed for me at once, but I seized my rifle by the barrel and struck her over the head, and then jumped to the bed of the creek and drew my knife, with which I dealt her a stab in the flank. As I struck, she reared upon me and bore me to the ground; and, while she placed her paw upon my head, bit me severely in the shoulder, the marks of which I still bear. I lay perfectly still, however, and in a few minutes the cubs began bawling, when the old Bear, seeing no resistance in me, turned to them. Seizing this opportunity, I sprang to my feet again and drew my pistol; but, observing at a glance that the stab in the flank was fatal, I did not fire. The poor brute was evidently dying, though she tried to pacify her cubs. Although I stood but a few yards distant, she had not the strength to come at me; for she had bled, and was still bleeding, profusely. As I watched her licking her young and giving them her last attentions, as if conscious of the approach of death, I thought there was something of the human in the Bear, and was sorry I had shot so affectionate a mother."[76]

As the Young Ones Grow

The development of the young is indicated by the following from Grizzly Adams:

"The Grizzly-bear generally cuts its teeth at about 2 months. It does not have full teeth till its maturity, at about 2 years of age, though it has a dangerous mouth at 6 months."[77]

Ordinarily, they pass the summer with their mother as sole guardian, but there seem to be some cases in which the father—that is, an interested adult male—has joined the party.

Catlin tells of a male and female Grizzly-bear that, accompanied by the cubs, came into his camp on the Missouri near the Yellowstone Fork and, on being molested, attacked him.[78] Evidently it was in the height of summer. Several instances of the kind are on record.

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[76] Grizzly Adams, pp. 280–81.

[77] Pp. 282–83.

[78] Life Among the Indians, pp. 128–31.

It is commonly agreed that the young Grizzlies stay with the mother till winter, and that all den up during the coldest weather, but it seems uncertain whether in this, their second winter, mother and young lie up in the same den.

It is probable that the Grizzly breeds but once in two years, unless the young are destroyed before midsummer. The young are able to shift for themselves the second year and are supposed to breed in the third.

At one time it was believed that the species would not breed in captivity, but we are better informed to-day in the handling of cage-animals, and the list of non-breeders grows less. Arthur B. Baker says: "A Grizzly-bear in one Zoological Garden produced, in 12 litters, 22 cubs, but only one was reared."[79]

Social Instincts—Voice, Trees, and Trails

Notwithstanding many accounts of Bears in droves, etc., the Grizzly is not a sociable or gregarious animal. The groups of 5, 6, or 7 Bears recorded are doubtless accidental and temporary associations of two families.

Wright says: "I have seen as many as 9 Grizzlies in one berry patch, and as many as 5 fishing in one riffle of a salmon stream; but they not only came and went singly, but, while there, they gave no outward sign of mutual recognition or even of mutual consciousness."[80]

Grizzlies cough, growl, grunt, roar, and sniff, in expression of various feelings. If they have a love song, it has not yet been recorded.

But the Grizzly, in common with the Blackbear, has another means of sending tidings to others of its race, and that is by the use of bear-trees or signposts, also called "registers" and "measuring trees." The remarks on the signposts of the Blackbear apply equally here. So far as I have seen, these Bears register their call in the same way. I never had the luck to see a wild Bear using them, but have once or twice seen the act in a zoo.

Hornaday, however, writing on the subject, says:

"On those trees, we saw where several of the rubbing Bears had bitten the trunk high up, tearing the bark open cross-wise. We also found, on some, raking claw-marks across the bark. Charlie Smith said that the tooth-marks are always made by the Grizzlies and the claw-marks by Blackbears."[81]

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[79] Smiths. Misc. Coll., 1904, No. 1434, p. 178.

[80] Grizzly Bear, p. 207.

[81] Camp-fires Can. Rockies, 1906, p. 159.

The only difference I have been able to see between the marks of the two species is that while the Grizzly leaves 5 claw-marks at each place, the Blackbear commonly leaves but 4, for the reason that its thumb is so short that the claw often misses.

So far as I know, W. H. Wright is the only observer who has actually seen the Grizzlies in a state of nature use these posts. He does not accept any of the current explanations of these "measuring trees," but neither does he suggest any other solution of the problem. He thus details the three times when he saw the Grizzlies using them:

"The first time was many years ago while sitting one evening on the side of a mountain watching 5 Grizzlies that were out feeding. It was August, and their hides were worthless, and I was studying them, with no idea of shooting. The Bears all came out of a thickly timbered cañon through which ran an old game trail made by Deer and Elk. I had often travelled this trail, and noticed that here and there large pieces had been ripped out of the trees, apparently by some animal with long, sharp teeth. Inspection indicated that two teeth had been sunk into the wood an inch or more, and then, by a sharp twist, a slab of wood had been torn off, and I had supposed the animal that did it was a Bear, for I could plainly see the mark of a Bear's claws in the bark.

"The evening in question, while watching the mouth of this cañon, I saw, first, an old she-Bear and her 2 yearling cubs appear and start feeding on the ripe berries. Later an old male came out and also started feasting; and these 4 Bears were making great inroads on the berries when a fifth appeared. He was smaller than the older male, but he came out of the cañon slowly and sedately, and seemed to be very lazy and not more than half awake. He came to the edge of the timber and, looking indifferently around, as these animals will under such circumstances, sat down and scratched his ear with his hind foot. He then got up lazily, sniffed up and down the trunk of a small fir tree, stretched his paws upward, and, raising himself on his hind feet to his extreme height, set his teeth into the small trunk and yanked off a chunk similar to those I had seen scattered along the trail. This was all done in the most unconcerned and bored manner imaginable, without any show of ugliness or temper. There was nothing to indicate in the least that the brute intended the act as a defiance or a challenge to any other Bear. He acted as if he had nothing to do and was hard pressed to pass away the time. Afterward he walked out to where the other Bears were, and joined them at berry-picking. The other male Bear paid no attention whatever to the action.

"On another occasion I saw two three-year-old Grizzlies peacefully

ambling along a side hill. They were tranquilly inclined and were apparently out for a promenade, with nothing of special importance on their minds. They would walk along for a short distance, stop and sniff at stumps, scratch a little, and then move on again. After a time they came to some trees, and one of them stood up with his paws against a trunk, smelled quite around it, turned his head sideways, drove his teeth through an inch or more of wood, and with a twist of his head ripped off a slab. He then sniffed at the open place, lapped it a little with his tongue, dropped down on all-fours, and followed the other Bear that had meanwhile moved on. In this instance it was the larger of the two Bears that did the "challenging."

"On the third occasion I saw a lone Bear stop beside a trail and go through practically this same performance. In each instance it was a Grizzly that did the biting. I have never seen a Blackbear make these marks on trees."[82]

The Bear has also fixed pathways through the woods and over difficult places. These it will use for years, till they are deeply worn. In going up a bank, or over logs, it will put its feet into the same tracks each time till they become a kind of stairway.

Wright testifies that "the Grizzly will travel in the same trail for years if not molested, and his trail is unlike any other game trail. He will step in the same place, Indian-like, every time, wearing deep indentations in the earth. The ground between the tracks is undisturbed. I have known trappers to take advantage of this fact and to dig beneath these tracks and place traps beneath them. If care is taken in placing the trap, the Bear is invariably caught."[83]

The Bear trails in the Bitterroot that are described in the Blackbear Life were undoubtedly made in part by the numerous Grizzlies that came each year to hook out the running salmon.

It is a remarkable fact that although all animals make and use trails more or less, it is only those of the lower order, such as rodents, that take the trouble to repair or improve their trails. If a tree branch falls across a Rabbit or Beaver trail, it is cut in two; if a twig grows up, it is nipped off. But the Bear, the Wapiti, and the Buffalo take no such trouble. If mere wear will improve their highway, it is improved, but if a tree fall across it or a self-rolled stone should block it, the lazy giant goes round the balk and strikes out a second trail.

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[82] Grizzly Bear, pp. 260–62

[83] Five Grizzlies.

PLATE VI.—CHIEFLY RUSSIAN BEARS
London Zoo

PLATE IX.—A NARROW ESCAPE
The pony and the Grizzly

Playful Grizzlies—The Skunk

It is quite in line with the endless variation of the Grizzly disposition that we should find some of them with a sense of humour and a bent for playfulness even though they are far from the habitual buffoonery of the Blackbear. Here is what Enos A. Mills has to say on the subject: "Rambling through the Medicine Bow Mountains of Colorado, one afternoon, I came upon a Grizzly-bear sitting on his haunches like a Dog, and looking with all attention across a Beaver pond. Making a quiet détour through the primeval forest, I found that he was watching a number of Otter playfully coasting on their slide."[84]

But Mills gives us an even brighter picture in which the Bear himself is the central figure: "A Grizzly-bear coasting on a steep mountain-side made a picturesque play spectacle. He was playing on a summit south of Long's Peak in what is now the Rocky Mountain National Park. As he sat down in the snow, put his fore paws on his knees, and jiggled himself along to start, he appeared strangely human. At one point he reached back his paw and put on brakes. He ended the coast with a jump and a somersault. Then, selecting a different place on the slope, he started down again, pushing himself along with both fore paws to get up speed. He ended this time by deliberately rolling over and over. Rising on hind feet, he looked at his marks on the snowy slope and climbed back up for another coast."[85]

Here are three tests of animal character that are always of most thrillsome interest, viz.:

What does it do when it meets a rattlesnake?

What does it do when it meets a Porcupine?

What does it do when it meets a Skunk?

On the first two, I find no light. But on the last, the acid test, I refer to the ever-delightful Enos A. Mills. His account runs thus:

"It was different the day the Grizzly met a Skunk. This Grizzly, as I knew him from tracking him, was something of an adventurer. His home territory was more than forty miles to the southeast. He had travelled this trail a number of times. On mere notion sometimes he turned back and ambled homeward.

"But this day the Grizzly saw the slow-walking Skunk coming long minutes before the black and white toddler with shiny plume arrived The Skunk is known and deferred to by wild folk, big and little. Regardless

[84] Adv. Nat. Guide, p. 205.

[85] Adv. Nat. Guide, pp. 203–24.

of his trail rights, the Grizzly went on to a siding to wait. This siding which he voluntarily took was some fifty feet from the trail. Here the Grizzly finally sat down. He waited and waited for the easy-going Skunk to arrive and pass.

"The approaching presence of the solemn, slow-going Skunk was too much, and the Grizzly just could not help playing the clown. He threw a somersault; he rolled over. Then, like a young puppy, he sat on an awkwardly held body to watch the Skunk pass. He pivoted his head to follow this unhastening fellow who was as dead to humour as the log by the trail."[86]

Never Attacks Man

Notwithstanding the sinister reputation that has won for him the names *horribilis*, *grisly*, *ferox*, etc., the Grizzly, according to all the best authorities, never attacks man, except when provoked. That is, he is a harmless, peaceful giant, perfectly satisfied to let you alone if you let him alone.

Even in the palmy days of the West, when he was the unquestioned monarch of the range, trapper and cowboy knew right well that they need only exercise a little self-restraint, show some decent courtesy to this big dignified giant in the fur cloak, and they need not fear but what he would respond.

In their first recorded meeting with the Grizzly, Lewis and Clark say: "Those we had seen did not appear desirous of encountering us."[87] In the course of their journey, they had about a dozen encounters with Grizzly-bears. In each of these, with the possible exception of two, the Bears were peacefully disposed until attacked. The two cases are discussed later.

In 1820, Major Stephen H. Long wrote: "Notwithstanding the formidable character of this Bear, we have not made use of any precautions against their attacks, and although they have been several times prowling about us in the night, they have not evinced any disposition to attack us at this season."[88]

In the early '40's, Rufus B. Sage, the Rocky Mountain hunter, wrote of the Grizzly that he knew so well: "He will almost invariably flee at the sight or scent of a man, and seldom attacks anyone unless wounded. When shot, he generally runs at full speed toward the sound, and woe to the unfortunate hunter who then comes in his way, unless fully prepared for a deadly encounter."[89]

[86] Watched, pp. 114–15.

[87] April 29, 1805, I, p. 214.

[88] Exped. Rocky Mts., 1823, II, p. 57.

[89] Rocky Mt. Life, 1857, p. 156.

About the same period, there was in California an old-timer named Walter Colton. He was a man of power, and for three years was Alcalde of Monterey. He left a journal of his term in office under the title "Three Years in California." His opportunities of seeing game were unlimited, and under the heading of "Friday, Dec. 11, 1846," is the following:

"The Grizzly Bear is the most formidable and ferocious animal in California; and yet, with all this ferocity of disposition, rarely attacks a man unless surprised or molested. The fellow never lies in wait for his victim. If the hunter invades his retreat or disputes his path, he will fight, but otherwise contents himself with the immunity which he finds in the wildness of his home and the savage grandeur of his nature."

Sir John Richardson says of his assistant, Thomas Drummond, who was the botanist on the Second Franklin Expedition, and made an important side trip to the headwaters of the Athabaska:

"Drummond, in his excursions over the Rocky Mountains, had frequent opportunities of observing the manners of the Grisly Bears, and it often happened that in turning the point of a rock or sharp angle of a valley, he came suddenly upon one or more of them. On such occasions, they reared on their hind legs and made a loud noise like a person breathing quick, but much harsher.

"He kept his ground without attempting to molest them, and they on their part, after attentively regarding him for some time, generally wheeled round and galloped off, though, from their known disposition, there is little doubt but he would have been torn in pieces had he lost his presence of mind and attempted to fly. When he discovered them from a distance, he generally frightened them away by beating on a large tin box, in which he carried his specimens of plants. He never saw more than four together, and two of these he supposes to have been cubs; he more often met them singly or in pairs. He was only once attacked, and then by a female, for the purpose of allowing her cubs time to escape. His gun on this occasion missed fire, but he kept her at bay with the stock of it, until some gentlemen of the Hudson's Bay Company, with whom he was travelling at the time, came up and drove her off."[90]

W. H. Wright, of Grizzly fame, writes: "Twenty-five years of intercourse with these beasts has taught me to regard them with the most profound respect. (p. 229.)

"I have never found him the ferocious and ill-natured brute that he has the reputation of being."[91]

[90] F. B. A., I, pp. 27–28.

[91] Grizzly Bear, p. 233.

On another page he tells of his hunting partner, Jack D. O'Brien, finding himself being watched by a Grizzly with three yearling cubs. His Dog barked at them, thereby provoking a fight. The mother Bear charged and fought till she and the family were killed.

"This is the only instance," he says, "that I have ever known personally where a Grizzly attacked a man without provocation, and in this case I lay it to the Dog. The Bear was an old one with 3 yearling cubs, and the presence and barking of the Dog were naturally offensive to her. And as the cubs and the Dog were doubtless the reasons for her unprovoked attack upon the man, so also the cubs and the Dog proved his salvation. For the Bear left him again and again and returned to interpose herself between the barking Dog and her cubs, which had not crossed the creek."[92]

In the *Mammalogical Journal* for February, 1923, p. 53, is an account of a Grizzly which killed a rancher named Joseph Duret, who lived on Slough Creek, five miles north of Yellowstone Park. On June 12, 1923, he trapped a large Grizzly, and, taking his rifle, he tried to kill it, but was mangled and killed by the Bear.

M. P. Skinner, Park naturalist, Yellowstone Park, who tells the tale, adds: "While this is a distressing occurrence, it should be given the widest publicity possible, for people must learn that Bears are dangerous animals if molested. It does not, however, alter my contention that even Grizzlies are harmless if let alone."

A Sleeping Man Is Safe

Virtually all records of the Grizzly attacking man have been in self-defense, when goaded to madness by wounds, etc. This statement finds a sort of inverted support in the widespread and apparently well-founded idea that the Grizzly never molests a sleeping man.

David Brown, the Bear hunter of the Yosemite, said to John Muir: "Bears are nobody's fools, and they know enough to let men alone as a general thing, unless they are wounded, or cornered, or have cubs. . . . Why they never tackle a fellow when he is lying asleep, I never could understand. They could gobble us mighty handy, but I suppose it's nature to respect a sleeping man."[93]

An incident with a similar motive is supplied by Major Stephen H. Long, who says: "Several hunters were pursued by a Grizzly-bear, that gained rapidly upon them; a boy belonging to the party, who possessed less speed than his companions, seeing the Bear at his heels, fell with his

[92] Grizzly Bear, p. 93.

[93] Yosemite, p. 618.

face to the soil; the Bear reared up on his hind-feet over the boy, looked down for a moment upon him, then bounded over him in pursuit of the fugitives."[94]

To this, I can add my own mite of corroborative testimony. Once or twice I have been aroused by a big Bear prowling around my tent at night. He ran off in each case when I shouted at him. But these were in the Yellowstone Park, so that I am not sure whether it counts or not.

A last, but emphatic and thrilling illustration, is given by Grizzly Adams. He had often warned his partner that if he ever fell into the power of a Grizzly, his only hope of escape lay in feigning death. In this way, Adams and many others had escaped injury, for the Grizzly has no interest in a dead man. Foster found an old Grizzly with her cubs. He fired and wounded her. She charged and downed him; instead of lying still, he struggled and shrieked. The Grizzly ripped him open and tore him to pieces.[95]

This sounds like a terrible revenge, an instance of unrestrained ferocity. But we must remember that the man was the aggressor, the Bear was maddened with wounds, and desperate by the menace to her cubs. She left the victim once he was conquered.

At another place Grizzly Adams bears testimony to the goodness of the Grizzly in these words: "From all my experience, and from what has reached me in the way of unquestionable information, the conviction is pressed upon my mind that the Grizzly-bear possesses a nature which, if taken in time and carefully improved, may be made the perfection of animal goodness." [96]

Doubtful Cases

In only one case do Lewis and Clark say that the Grizzly charged without provocation. This exceptional affair took place at the Falls of the Missouri, June 14, 1805, and is recorded in these words:

"He beheld a large brown Bear who was stealing on him unperceived, and was already within 20 steps. In the first moment of surprise, he lifted his rifle, but remembering instantly that it was not charged, and that he had not time to reload, he felt that there was no safety but in flight. It was in the open, level plain, not a bush nor a tree within 300 yards, the bank of the river sloping and not more than 3 feet high, so that there was no possible mode of concealment. Captain Lewis, therefore, thought of retreating in a

[94] Exped. Rocky Mts., 1823, II, p. 57.

[95] Grizzly Adams, pp. 145–46.

[96] Grizzly Adams, p. 63.

quick walk, as fast as the Bear advanced, towards the nearest tree; but as soon as he turned the Bear ran, open mouth and at full speed, upon him. Captain Lewis ran about 80 yards, but finding that the animal gained on him fast, it flashed on his mind that by getting into the water to such a depth that the Bear would be obliged to attack him swimming, there was still some chance of his life; he, therefore, turned short, plunged into the river about waist deep, and facing about, presented the point of his espontoon [a short pike]. The Bear arrived at the water's edge within 20 feet of him, but as soon as he put himself in this posture of defense, he seemed frightened, and wheeling about, retreated with as much precipitation as he had pursued."[97]

To this, Sergeant Patrick Gass adds another:

"*July 15, 1806.* A White Bear met him [Capt. Lewis] at Willow Creek, that so frightened his Horse, that he threw him off among the feet of the animal; but he fortunately (being too near to shoot) had sufficient presence of mind to hit the Bear on the head with his gun; and the stroke so stunned it, that it gave him time to get up a tree close by before it could seize him. The blow, however, broke the gun and rendered it useless; and the Bear watched him about 3 hours and went away; when he came down, caught his Horse about 2 miles distant, and returned to camp. These Bears are very numerous in this part of the country and very dangerous, as they will attack a man every opportunity."[98]

Both of these cases seem very doubtful. In the first, it looks as though curiosity or else interest in a new-killed Buffalo near by, was the cause of the Bear's approach. In the second, it was an accidental meeting in which the man at once acted on the aggressive; in neither case was the man hurt.

John B. Burnham, when on one of his Alaskan trips, had an adventure which, at first, looked like an unprovoked Grizzly attack. He was travelling with a full pack train, he says: and then: "About 3 o'clock I saw a Bear come over the top of a hill 500 yards to our right, and called the attention of the party to it. Hunting Bears with a belled pack train was a new and unexpected experience. We decided, however, we had enough Bears. We had just reached the decision to let the Bear go, when he saw our Horses on the sky-line, and he nearly ended his earthly career by charging directly at us, thinking, no doubt, we were Caribou.

"In the direction we were travelling, the Bear would soon get our wind. For a moment I was tempted to send the pack train under cover so that Koert and I could ambush and kill the Grizzly as a rebuke to his arrogance,

[97] Lewis & Clark, I, p. 284.

[98] Gass, p. 260.

PLATE VII.—GRIZZLY POSES (FROM LIFE)

but we were interested to see what the Bear would do, so kept on without changing our course. Nicolai, it may be assumed, was far from happy. Koert remarked on the speed of the Grizzly, saying he had always before thought he could run faster than a Bear, but was satisfied this Bear could run as fast as a Horse. Neither of us took our rifles from their scabbards as the flesh surged backward and forward with each jump. He was within easy rifle shot, probably not more than 80 yards away, when the Bear first winded us, and he did exactly what one would have expected. He tried to stop so suddenly that he slid several yards on his hams, and when his momentum had been sufficiently absorbed, he executed an abrupt about-face, and when he disappeared over the sky line, he was going just as fast in the opposite direction."

Referring to a previous occasion when his companion Hirst was apparently charged, though not harmed, by a Bear, Burnham says: "One reason I made no attempt to shoot the Bear which charged us, was to test the theory I had formed that Grizzlies fear the scent of man more than the sight of man. Hirst's Bear had charged down wind and had recognized through the slower process of sight that he was attacking men. Our Bear had in all probability no knowledge of what we were until he was suddenly unnerved by the shock of something unexpected and gruesome. In human beings the nearest parallel is to be found in the fear of the supernatural as compared with what is understood. If our Bear had charged down wind we should no doubt have been obliged to kill him."[99]

Undoubted Cases of Grizzly Ferocity

There is a vast number of hunting stories in which the man wounded, but not disabled, a perfectly inoffensive Grizzly that chanced within range—cases in which the Bear, maddened by pain, exerted his mighty powers in revenge, and with more or less success. Omitting these, I quote the following apparently authentic cases in which Grizzlies made aggressive and ferocious attacks on mankind without any known provocation whatever.

The first is given very fully in Richardson's "Arctic Zoology."[100] A party of voyageurs were camped by their fire in the evening when a Grizzly leaped into the circle, and carried off one man. Another, Bourasso, pursued with a gun, shot the Bear and rescued the man.

The next case is that of Ned Frost, the well-known guide. He was in charge of a party of tourists in the Yellowstone Park some 10 years ago.

[99] An Alaskan Hunt for Sheep, Bears and Caribou, by John B. Burnham, Outdoor Life, May, 1924, pp. 335–36.

[100] F. B. A., I, p. 27.

During the night, a Grizzly, evidently attracted by the provisions, entered the tent and walked over the Horse wrangler, Jones. Frost yelled and threw his pillow at the Bear. It seized him and dragged him off, bed and all. But Frost escaped up a tree, badly mauled, though ultimately he made a good recovery.

The last case, and the only fatal one in the Park was that of Jack Walsh, the teamster, who, in the summer of 1916, was killed at Turbid Lake in the Yellowstone Park. He was sleeping under his wagon when, during the night, the Grizzly, without provocation, attacked him and mauled him so that he died some days later.

The Park authorities tell me that Walsh slept with his bacon under his pillow; hence the approach of the Bear; and that the man probably provoked the Bear by striking him. Apparently the wounds alone were not enough to kill Walsh, as he died of bloodpoisoning and peritonitis.

A tragic case that may or may not be in point, is furnished by Will C. Barnes of the Forestry Department. He says:

"A few years ago the body of an old prospector and trapper known in the region as J—— S—— was found by a ranger in one of the national forests in the high Sierras of California. The body had been terribly mauled and torn by Bears and perhaps other wild animals, and all the evidences pointed to a fight to the death with an old mother Bear and two cubs. Nothing was found in the man's effects to lead to the location of his friends, and absolutely nothing of his past or home ties was known in the region. The body was duly and officially viewed by a Coroner's jury, which decided he had been killed in a Bear fight, and he was buried near where found."[101]

[101] Sat. Eve. Post., Dec. 6, 1924, p. 153. Barnes's further comment is as follows: "Naturally the case got into the local papers, from which it was widely copied. Some weeks later, the ranger who found the body, received a letter from a woman in a midwest State, of which the following is an exact copy:

"'Kind and Respected Cir: I see in the paper that a man named J—— S—— was atacted and et up by a bare whose cubs he was trying to git when the she bare came up and stopt him by eatin him up in the mountains near your town. What i want to know is did it kill him or was he only partly et up and he from this place and all about the bare. I don't know but what he is a distant husband of mine. My first husband was of that name and I suppose he was killed in the war but the name of the man the bare et being the same i thought it might be him after all and i thought to know if he wasn't killed either in the war or by the bare for i have been married twice since and their ought to be a divorce papers got out by him or me if the bare did not eat him all up. If it is him you will know it by having six toes on the left foot. He also sings base and has a spread eagle tattooed on his front chest and a anker on his right arm which you will know him if the bare did not eat up these parts of him. If alive dont tell him i am married to J—— W—— for he never liked J——. Mebbe you had better let on as if I am ded but find out all you can about him without him knowing anything what it is for. That is if the bare did not eat him all up. If it did i don't see you can do anything and you neednt take any trouble. My respeks to your family and please ancer back.

"'P. S. Was the bare killed. Also was he married again and did he leave any property worth me laying claim to?'" Signed ——

Those who wish to revel in sanguinary tales of the Grizzlies' attacks after being driven mad by deadly wounds, are referred to Grizzly Adams, to Audubon & Bachman, III, p. 143, *et. seq.*, to W. H. Wright's Book, to the current sporting magazines, and especially to Elmer Frank's terrific battle with 5 Grizzlies in Halleck Cañon, Wyo., in the fall of 1889. It is fully set forth in *Outing* for November, 1901, pp. 147–51. Also to J. M. Christie's "Death Struggle with a Grizzly," which appeared in *Forest & Stream* for April, 1919, pp. 899–902. Christie was 7 miles from his shanty in a remote valley in Alaska, when he mortally wounded the Grizzly. But it caught him before it died and chewed his face and head to pulp, broke his jaw and his arm, and mangled his thigh. Yet this man of marvellous grit managed to crawl to his camp, and ultimately to recover. He rendered good service to his country during the war.

A Measure of Valour

As one reads this chronicle of the Grizzly in his contacts with our race, one must realize that, unlike the Beaver, the Buffalo, or the Deer, his chief service to us has been sentimental. He has served as a measure of valour. to have faced and conquered a Grizzly was acclaimed throughout the West as evidence extraordinary of matchless personal prowess. The proof of the same—the monster's claws strung in a necklace—was the accepted outward and visible sign of this valour unexcelled, and was worn with becoming pride. This, it will be remembered, was one of the greatest exploits of the hero Hiawatha. He went to the Far West, there he clubbed and killed the mighty Mishe-mokwa, and returned with the trophy string of claws.

In Charles G. Leland's "Biography of James P. Beckwourth," the famous mulatto who became chief of the Crow Indians in the '40's, there is a well-attested story which makes Beckwourth the victor in a hand-to-hand fight with a Grizzly.

After referring to Jim Beckwourth's fame as the "biggest liar" in the West, Leland says: "Against this cloudy reputation, it may be remarked that heretofore the most extraordinary, desperately daring and highly creditable adventure of his life, the account of which I had from an eye-witness who was a truthful gentleman, if such a man ever existed and who had been at the same university when I myself graduated—is *not mentioned* in Bonner's Life [of Beckwourth]. It is as follows:

"Beckwourth was a very powerful man, he had been a blacksmith, and he certainly was a desperately brave fighter.

"A very large Grizzly Bear had been driven into a cave, and Beck-

wourth asked of a great number of Crows who were present whether any one of them would go in and kill the creature. All declined, for it seemed to be certain death. Then Beckwourth stripped himself naked, and wrapping a Mexican blanket round his left arm, and holding a strong, sharp knife, entered the cave, and, after a desperate fight, killed the Bear. I came up to the place in time to see Beckwourth come out of the cave, all torn and bleeding. He looked like the devil, if ever man did. The Crows were so much pleased at this that he was declared a sub-chief on the spot."[102]

The summer of 1897, I spent in the Yellowstone Park at John Yancey's camp. Yancey had lived with the Crows during the latter part of Beckwourth's time, and knew the old Scout well. He described him as a very Hercules, and an adept with the bowie knife, preferring it to the revolver for hand-to-hand fight. I asked Yancey about the above incident. He said he never heard of that particular Bear fight, but it was the sort of thing Beckwourth would do, and more than once did. He did not believe that Beckwourth stripped before entering the cave, but thought it quite likely the old desperado had his clothes all torn off before he got out again.

Tame Grizzlies

Although the Grizzly is often dangerous and the Blackbear comparatively mild and inoffensive, the Grizzly has several times been completely domesticated, and, so far as I know, the Blackbear never; that is, never wholly and successfully, in spite of many experiments. The Blackbear usually grows cranky and unreliable as he reaches maturity, but, so far as recorded, the Grizzly has never been guilty of treachery. His tameness, when he is tame, is of that gentle, flawless kind that we look for in the Dog.

It goes without saying that such results can be obtained only if the Grizzly be captured as a small cub, and brought up by hand. A Grizzly captured after fully grown, cannot be so tamed.

The earliest account of the tame Grizzly that I can find appears in Stephen H. Long's "Expedition to the Rocky Mountains" in 1823. On page 55, II, he says: "Dixon, the Indian trader, told a friend of mine . . . that notwithstanding its ferocity, it has been sometimes domesticated, and that an Indian belonging to a tribe on the head waters of the Mississippi had one in a reclaimed state, which he sportively directed to go into a canoe belonging to another tribe of Indians, then about returning from a visit: the Bear obeyed and was struck by an Indian; being considered one of the family,

[102] Life and Adventures of James P. Beckwourth, by T. D. Bonner, edited by C. G. Leland, 1892 edition, pp. 8–9.

this was deemed an insult, was resented accordingly, and produced a war between these nations."

But the most successful attempts and most delightful account, are by Grizzly Adams. He had 4 or 5 tame Grizzlies, with which he prowled about the wildest parts of the West in the early '50's. These were Lady Washington, and her brother Jackson, Funny Joe, and Fremont, but, best of all, Ben Franklin, his bosom companion for years.

This famous old Bear hunter had killed the mother of two yearling cubs. But the young ones escaped into the woods, and were big enough to take care of themselves. Adams found out within a few days that they came nightly to drink at a certain spring, so laid in wait with his comrades in hopes of catching the cubs. The men had watched all night till dawn was streaking the east.

He had the good luck to lasso both.

"Such was the manner in which my Bear, Lady Washington, one of the companions of my future hunting life, was captured. From that time to this, she has always been with me; and often has she shared my dangers and privations, borne my burdens, and partaken of my meals. The reader may be surprised to hear of a Grizzly companion and friend; but Lady Washington has been both to me. He may hardly credit the accounts of my nestling up between her and the fire to keep both sides warm under the winter colds of the mountains; but they are all true; let him only read on."[103]

He trained her carefully; did not, indeed, spare the rod when necessary; but after the first few months, she responded completely. She followed and obeyed him with dog-like fidelity. In Adams's own words, "I felt for her an affection which I have seldom given to any human being."[104]

But the best of his Grizzlies was Ben Franklin, who, with his twin brother, was taken from the mother's den as related in the section on *Young*.

For several years, one or other of these Bears, but especially Ben, was his daily and nightly companion. By day, he carried burdens on his back or drew a wheel cart. Sometimes he carried Adams himself astride his massive, shaggy back. By night, he was an unremitting sentry of marvellous vigilance, and at the same time a warm and comforting bedfellow screening his master from cold winds as they lay together by the fire. And at all times, Ben was ready to die in defense of his master in any kind of onslaught. More than once he saved Adams's life from desperate attack by big wild Grizzlies, and on one occasion from a couple of Jaguars.

To narrate all his exploits would be to transcribe too large a portion

[103] Grizzly Adams, pp. 26–28.

[104] As above, pp. 106–07.

of the Grizzly Adams book, for nearly all through that stirring record of life in the wild West of the heroic period from 1852 to 1858, he appears as Adams's Dog, Horse, and friend.

Natural history contains no parallel record of such absolute, loving, unselfish devotion to a man on the part of an animal, except, perhaps, in the case of certain Dogs. The reader is counselled to get and read the story. In the main it is believed to be true, and it stands unique among annals of the wilds. It is full of quaint natural history, and is disfigured only, as was the fashion of the times, by the long, relentless daily slaughtering of wild life that reddens nearly every page.

I find there are those who question Grizzly Adams's veracity in many directions. But of this there can be no doubt: he did tame and travel about with one or more Grizzlies. I have met many men who knew him personally in the West, and when he came to New York with his big Bear, Samson, in 1860, he and his Bear were daily seen by hundreds.

Without Precedent

An old gold prospector told me of an experience he once had that was unique, at least, in its finish. I am sorry I cannot recall the old man's name.

In those wild and splendid days, most men were goldhunters, at least part of the time. The equipment for the job was a rifle with plenty of ammunition, a gold pan, a bundle of dried venison or "jerky," and a 3-ounce bottle of laudanum.

Why the laudanum?

"Wall, ye see, we travels mostly alone, hundreds of miles from any settlement. We go climbing round all sorts of rocky heads and gulches, and many a man slips and, if he is lucky, he breaks his damned neck and hez a flying finish. But if he only breaks his leg and is out o' human reach, what's he goin' ter do? Lie there and slowly starve to death? Yes, that's what many fellers has done, till we larned another way. We all carry the bottle of dope. And when we're up agin it with a broken leg, we can at least draw the cork, swaller the dope, and jes' quietly go ter sleep. Yes, sir, that little bottle is our last good friend."

They all carried it, and the old prospector told me of a new lead that he was hoping to strike in southern Colorado. He was not far from his camp and he had gotten "good colour" out of a small stream, when he found that he was being curiously watched by a huge Grizzly, who stood up on his hind legs only 30 feet away. Most of the miners meeting a Bear accepted the code: "Let him alone and he'll let you alone." But this was so near and so sudden that the old-timer lost his head. He snatched his rifle and fired

quickly, all too quickly. The Bear fell backward, but had suffered only an infuriating wound. The man had no chance to reload, but was able to reach a tree just in time.

The Grizzly growled and reared up, raked the tree, and showed in many ways that he meant to get that man. All day the siege kept up. Once or twice the Grizzly seemed disposed to go away.

Then, late in the afternoon, he did actually disappear. The man cautiously slid down to get his rifle, but the moment he touched earth, there was a terrific roar and the Grizzly charged from his ambush so quickly that the man barely escaped up the tree.

Night came on. The Grizzly was still on watch. The man had to tie himself to the tree to keep from falling. Morning—and still there was that terrible monster waiting.

This second day wore slowly on till nearly noon. Then, all at once, a new thought struck the man. Salvation!

In his wallet, he had some chunks of dried venison. He got them out, he chewed them into a soft mass—soft, but dry, for he was parched with thirst. Then he got out his bottle and saturated the mass with the laudanum. By pretending to come down, he decoyed the Grizzly to the foot of the tree. Then right in his face he dropped the dopy meat.

The monster sniffed it once or twice, then licked it up, and after a few chops, swallowed it all.

It was slow in working. It took much to permeate that huge form; but it worked. The giant brute swung his head listlessly awhile, dropped it lower, went slowly off, swinging in a circle, gently sank on the ground, and in five minutes was snoring softly.

The man shouted, pretended to come down. The Bear paid no heed, but placidly breathed. The man slipped down, got his rifle, sneaked off to a distance, reloaded, crawled back, and at short range, made sure by putting a ball between the eyes of the unconscious brute.

"Yes, sir, a bottle of dope is good to hev along."

Hunting with the Bow

Two young men, Dr. Saxton Pope and Arthur Young, of San Francisco, have been pioneers in reviving the noble art of hunting with the bow. In such pursuit, one soon realizes the terrific power of a bow whose pull is 75 pounds. It will drive an arrow through an inch board. For short range, it is as dangerous as a rifle, although it cannot be so exactly aimed.

These modern Robin Hoods began the sport on Rabbit and quail, but

graduated into Bobcats, Deer, and finally Blackbear and Cougar. All fell easily and quickly to the deadly cloth yard shaft.

There was but one worthy foe untried—the Grizzly. Armed with a permit from the Secretary of the Interior to kill 5 Grizzlies in the Yellowstone Park, as material for California University Museum, they trained, made special bows and arrows, and in the summer and early autumn of 1920, went nervily to their brave adventure; for they meant to kill with the bow and arrow.

The amazing demonstration was that they not only killed all with arrows, but in some cases a single arrow was enough to lay the mighty Grizzly low.

Those who wish to get all the details, must read their book, "Hunting with the Bow and Arrow."

The Mind and Brain of the Grizzly

The mentality of the Grizzly is far inferior to that of Dog or Wolf. But its powers of scent and hearing are so exquisite, and its ability to travel fast, far, silently, and unseen, so great, that, once it has learned the danger of rashness, it shapes its life behaviour on lines that look like profound sagacity.

Most important light on the mental equipment of the Grizzly is furnished by Dr. E. G. Lancaster, of Colorado College. When the famous old Grizzly of Canyon City was killed, his head was sent to Doctor Lancaster, who made a careful examination of the brain, and reported as follows:

"One of the most interesting brains I have ever seen lies on the laboratory table before me. It is the brain of 'Old Mose,' the huge Grizzly which was recently killed on the hills south of Pike's Peak by J. W. Anthony. The brain is 6 inches long, including the hind brain, 4 inches in width, and weighs 15 ounces. The Bear was estimated to weigh 1,000 pounds, so that the ratio of his brain to his body is only 1 to 1,000, while that of a new-born babe is 1 to 7. As a matter of fact, the brain of this monster is lighter than that of the babe, about equal to that of a calf a few weeks old. A man has a brain more than 3 times as heavy. The ratio of a man's brain to his body is 1 to 45.

"The ratio of brain to body is usually a sign of intelligence, and hence it is high in the Ape—1 to 80—and quite high in other wild and domestic animals which are usually regarded as intelligent. In the Dog, it is 1 to 164, in case of a large Dog; and 1 to 45 in a small Dog; 1 to 747 in an Elephant and 1 to 22,500 in a Whale. The Marmoset has the heaviest relative weight except the infant, it being 1 to 18, while the man's is only 1 to 45.

PLATE VIII.—LIFE STUDIES OF VARIOUS GRIZZLIES

The infant's is really 1 to 6, since his total weight is 7 pounds, while his brain weighs 1 pound.

"The distribution of parts and the balance between them is the best test, for weight may be so distributed as to give little to the intellectual centres and much to motor. This is the case before us. While this Grizzly had almost as high a brain ratio as an Elephant, his centres are so balanced as to give little to intelligence and more to smell and hearing; as compared to the Elephant's brain, which is highly developed in the frontal lobes and cerebrum, where intelligence is located.

"On opening the skull, the first thing about the brain of 'Old Mose' is its location in the head. The brain of Dogs and such animals usually runs forward nearly to the line of the eyes, and fills the skull cavity. With this Bear, at least, the brain occupies only a small part of the head, which is 15 inches long in a straight line from the back of skull to end of lower jaw, and is 14 inches wide after the skin is removed.

"The front end of the brain was about 4 inches behind the eyes, and all the intervening space was filled with a porous, or cellular, structure of bone, with scores of cavities large enough to insert the tips of the fingers into the cells or chambers. This is interesting to the hunter. It explains why he finds it so hard to kill the Grizzly by firing a ball into the front of the head. The chances are that it would not reach the brain, and a dozen bullets might lodge in those chambers and do little damage to the life of the Bear. The bullet must strike between or just back of the eyes, and take a downward course to hit the brain.

"On the sides of the head, moreover, the masseter and temporal muscles are 4 inches thick by actual measurement, and hence a bullet, unless fired at close range, would hardly pass through them and penetrate the skull, which slopes on the sides like the roof of a house, from the top or ridge of the head down to the base. On the ridge, the skull is quite thick, but it is a surprise to find that the skull is only $\frac{3}{16}$ of an inch thick on the sides, or about as thick as the skull of a man. Its shape and the thickness of the muscles give the well-known protection to the brain of the Grizzly. From the side, the bullet would tend to glance upward and miss the brain unless fired downward at an angle of 15 to 25 degrees.

"It is a well-known fact that the habits of an animal have a close relationship to its brain. For this reason, the intelligence and life of an animal can only be understood fully when we see the brain and study the relation of part to part. For example, the brains of animals living by sight are largely given up to visual centres. The best example at hand is the brain of the trout, which is largely made up of optic lobes. They

occupy about three quarters of the brain cavity, while the cerebrum is almost wanting. In the shark and skate, on the other hand, most of the brain is devoted to smell, and the olfactory bulbs are extremely large, relative to other parts. One can tell by the way a fish bites, whether its taste centre or eye centre is most prominently developed. The eye-minded fish will bite on the run, while the other will nibble the bait.

"Now, in the brain of 'Old Mose,' two centres are enormously developed. They are the centres of smell and hearing, both of which are in the temporal lobe. To our surprise, the optic nerve is small and the optic centres are poorly developed. Technically speaking, the upper pair of the *corpora quadragemia*, the lowest centre of sight, are very much smaller than the lower pair, or the lowest centre of hearing. But the olfactory bulbs are developed beyond all comparison. The Coyote has been the standard in our laboratory for acute sense of smell, judging by the size of the olfactory bulbs, but he has a weak sense of smell compared to the Bear.

"The brain is also wide at the back, or across the motor centres, so that the Bear had three good faculties—smell, hearing, and motor power—while he used his eyes only for objects near at hand, and for those probably which are not dangerous to his life. In a word, when his nose said 'trap' or 'hunter' or 'food' he obeyed the word. He lived by this sense very largely, and no doubt his keenness of scent has kept his feet out of many a trap and his body from many a rifle ball.

"This Bear never did much thinking. Yet we wonder how a Grizzly could live 40 years inside of a circle of cities, none of which were more than 50 miles from him, killing Cattle by hundreds and sometimes men for variety. Yesterday a man came to look at his hide and fairly wept when he told how his best friend was killed by this old 'Terror of the Mountains.' Hunters have been after him for years. Traps have been set, and all plans known have been executed against his life. He was evidently cunning, but not intelligent. It was all instinctive with him.

"We do not appreciate his keenness of scent. Lloyd Morgan threw a stone over a bank into loose rock, in the night time, and his Dog brought it back 11 times in 20 minutes, depending on his sense of smell for finding it, save as he got the direction from the thrower. The Coyote has a much keener scent than the Dog, but this old Bear would surpass either of them as easily as Sherlock Holmes would surpass the average man in detective work.

"It is interesting to build up the character of such an animal as this from his brain. It is easy. He had no moral nature, he did not reason, he did not love or hate, probably. If let alone, he was mild and peaceable. If

frightened, or injured, or hungry, his instincts said run, crush, or kill, and he did it. He lived a purely instinctive life and every animal instinctively tries to preserve its own life. Instincts are for that purpose only. This Bear, like some criminals, could not be moved by reason or high motives. He would do the thing that would satisfy his appetite and passions, and follow his instincts for self-preservation when pursued. His whole life began and ended within this narrow mental horizon."[105]

Can a Bear Count?

In the Golden Gate Park Zoo, when I was there in 1899, was a Grizzly which the keeper said could count. The proof was this: The Bear would open his mouth for peanuts to be thrown in. Some went in, but most fell to the floor of the cage. When, say, 1 went in and 5 fell to the floor, the Bear would chop that 1, then drop to all fours and look about for the 5. He licked them up quickly and if only 5 fell, he never looked for 6, but always for the exact number that fell. It could hardly have been smell, for the floor was littered with nut shells. The experiment was performed by myself and others on a number of occasions and seemed satisfactory. At this time and distance, I am disposed to question the exactness of the test conditions.

The Compact of the Wild Things

A hint, if not a detailed demonstration, of wild animal coöperation is found in Col. William D. Pickett's description of the still-hunt in which he killed 4 Bears, which hunt resulted in the naming of Four-Bears Post Office, Wyo.

A number of Cattle had been killed by accident, and soon the Colonel's expert hunter-sense told him that Grizzly-bears were coming nightly to the feast. For these he lay in wait. He went one evening to the head of the trail the Bear used. "Coming from the thicket, a Porcupine was encountered, and by punching him with my rifle, he was made to climb a small tree, and was made an object lesson—a sign that there was no danger.

. . . . . .

"When within 100 feet of the rim of the gulch, a Coyote passed just in front of me, and disappeared down toward where the Bear would be found. I knew he would at once give the alarm. . . . When within 50 feet of the brink, two dark objects appeared, walking rapidly, up the opposite slope. . . . They moved about, back and forth, in a most intricate

[106] Outdoor Life, July, 1904, pp. 415–17.

or fantastic fashion, sitting up occasionally to try to discover danger. They evidently had not believed the Coyote talk, yet they were unwilling to take any chances. . . . Had they believed the Coyote's tale at first, they would have come up from the gulch on a run and disappeared."[106]

Just what the Colonel meant by these half statements about the universal understanding of the animals, I do not know. Yet he was alluding to something that is widely assumed and accepted among the men of the wilderness.

The Wisdom of Mishe-Mokwa

It has been said that no two Grizzlies are alike in size, colour, or habits. This fact is more or less visible and self-demonstrated. But closely related to it is another common saying in the West—that a Grizzly is a most unreliable animal. You never know what it is going to do next, but you may be very sure it is going to be quick about it.

Wright says: "He is the only animal I have ever hunted whose habits you cannot depend upon; you may be hunting where he is feeding upon berries, and because you saw him out feeding every morning for two weeks at precisely 8 o'clock, there is no reason why you should expect him the following morning at 8 o'clock. It would be just like him to come out then at high noon—a time when no self-respecting Bear would think of showing himself."[107]

In some regions, the Grizzlies run to flesh-eating, and finally to its criminal climax, Cattle-killing; in other regions the big Bear at is all times strictly vegetarian.

Concerning their disposition, Roosevelt writes: "My own experience with Bears tends to make me lay special emphasis upon their variation in temper. There are savage and cowardly Bears, just as there are big and little ones; and sometimes these variations are very marked among Bears of the same district, and at other times, all the Bears of one district will seem to have a common code of behaviour which differs utterly from that of the Bears of another district."[108]

Wise Grizzlies and super-wise there always were, and mediocre and fools. But the fools went early; they were weeded out by the hunters as soon as repeating rifles appeared. The stupid and the commonplace went next, and the ten-times sifted remnant are the wisest of the wise in their kind.

[106]Forest & Stream, Oct. 18, 1913, Four Bears Creek, Col. W. D. Pickett, p. 488.
[107]Five Grizzlies, p. 6540.
[108]The Bear's Disposition, Trail & Camp-fire, p. 230.

The Grizzly that is not trap-wise as well as man-wise is rare to-day and passing.

The trap-wisdom of the Grizzly is, of course, a recent development since the new era set in, but it appeared very promptly when the occasion for it arose.

William Wells, the old-timer of Wyoming, writes of Grizzlies in the '70's:

"Even at that time, Bears were sometimes very cunning. There was one old Cinnamon that it took 7 days to trap. I had killed a Deer and set a trap, and that night the old fellow came around. I had wounded a Deer at the same time that I had killed the bait, but had not found it. The old Bear, however, picked it up, brought it down alongside the trap, ate it up, pulled the bait out of the pen, ate what he wanted, and went off. And for 6 nights he came back, every night nearly eating a whole Deer, which I took pains to keep ready for him, but never getting caught.

"By the sixth night, I had 3 traps set for him, and a solid log pen 5 feet high, 15 feet long, and about 2 wide. By this time, I had a half wagon-load of bones piled up in the end of the pen, on top of which I used to place his nightly lunch. I had one trap set in the pen, and the other two set where I thought the Bear might step.

"But he didn't. He would come along, step carefully over the trap in the pen, grab hold of his fresh Deer, back out carefully again, dragging the bait over the trap and springing it, eat what he wanted, and depart.

"The seventh night, though, he came to grief. I took an old double-barrel, muzzle-loading shotgun of 10-gauge, and put 10 drams of powder in each barrel; then on top of that I put slugs of lead 2 inches long. Then I fixed the gun under the pile of bones so that it raked the pen lengthwise, put a new Deer on top of the bones, ran a string from the bait to the trigger, cocked both barrels, and went down to camp, a mile or so away.

"An hour or so after dark, the gun went off, and directly after, I heard the Bear roaring. Next morning I went up, but things were not as I expected to find them. The Bear had gone into the pen and pulled the bait, both barrels had gone off and never touched him.

"How it happened, I have never been able to figure out. The pen was just wide enough to let him in, the muzzle of the gun was just under the bait, and both slugs were in a quaking asp tree that stood opposite the mouth of the pen. And the Bear was in the pen when the gun went off, because the marks of his teeth were on the bait, and he was hard and fast by the hind leg in the trap that had been set at the mouth of the pen. I always thought that when the gun went off in his face, he got so badly rattled that he forgot about the trap and backed into it, though how those slugs missed him, is

beyond me. Of course, he might have been crawling on his belly, and the slugs gone over his back, but it did not seem as if there were room. And if the charge went between his legs it looks as if the hair would have been powder-burned, which it was not.

"The cunning of some of the old Bears is almost beyond belief. There was one big Grizzly that several of us hunted off and on for years, but neither traps nor still-hunting nor Dogs had any effect. And he is there yet, waiting for some lucky hunter."[109]

Of all his senses, his nose is his best and most relied on. Henry L. Stimson, speaking of baiting for Grizzlies, says:

"The greatest danger to success, however, is that your game will actually scent you while you are waiting for it. It is not always flattering to a gentleman's feelings to observe the rapidity with which a beast, which has only been pleased and attracted by the overpowering stench of the carcass beside you, will be put to headlong flight by the faintest whiff of you. But one can count with the utmost positiveness on that result."[110]

The eternal vigilance, the consummate shyness and wariness of the Big Bear, are admirably set forth by Wright. He refers to the hunting of a Grizzly by trailing him in the snow. In this way, important evidence on his food habits is obtained, as well as proof of his watchfulness.

"In following one of these trails," he says, "one will find, every little while, where the Bear has made a circuit to the side and rear, so as to get to windward of his own back trail, and so assure himself that no danger follows on his track.

"The Bear is wary and he often will make a détour of a mile or more, and will stand quietly for some time until satisfied that there is nothing of a suspicious nature within reasonable distance of him. Then, if it is autumn and in the mountains, he will resume his hunt for Gophers and Marmots."[111]

In a line with this making of a détour, is the following. A. A. Anderson, of Four Bears, Wyo., tells me: "I once knew a Bear I was hunting run around and get behind me and my Dog, then follow us as we followed his previous trail."

His Change of Mind

"In the old days," says William Wells, "the Bear was a beast of the open country, a daylight traveller, seeking his food when and how he

[109] Forest & Stream, Jan. 7, 1899, p. 6.

[110] Trail & Camp-fire, 1897, p. 248.

[111] Grizzly Bear, p. 79.

pleased. As neither the white trapper nor the Indian made a practice of molesting Bruin, killing him only when the occasion called for it, Bears had very little fear of human beings.

"More than one old he-Grizzly had made me give the trail, just because I did not happen to have a gun."[112]

Then the great change set in. Settlers were flooding the Grizzly range, repeating rifles came into general use, war was declared on the Big Bear.

Wells says: "Up until along in the early '80's, Bears were not hunted much; but along about '89, the skins took a jump in price, and at the same time some of the Western States put a bounty on Bruin. This made hunting them profitable, and they commenced to decrease rapidly. Before this time, hardly anyone killed them except during the short season in spring and fall when the fur was good. But now, when every Bear, cubs and all, were worth $10 a piece, the poor brutes had no rest. As a usual thing, Bears take bait poorly during the early spring and late fall, but during July and August they take any kind of animal food, carrion or not, greedily. Consequently, most of the Bears trapped for bounty were killed when the fur was not good, and any number of Bears had only the scalps taken. From this time on, Bears began to change their habits greatly."[113]

It would seem as though, after the winter sleep the Big Bears reverted somewhat to their old-time habits. But very little contact with the arch-exterminator was needed to revive the dread memories of the season past. For Wells continues:

"Even now Bears feed a good deal in the open in the spring, when they are not molested, and spring is by far the best time to hunt them. But, as a usual thing, a Bear nowadays keeps pretty well under cover. During the day he finds the thickest brush or timber that he can, and there he stays, slipping away quietly at the slightest suspicious noise. It used to be that if a Bear heard or saw something that he did not understand, he would stand up on his hind legs to look. And if he was suddenly startled he would often, after running a way, stop and stand up to look back. I have killed several Bears in thick brush by getting close to them, knowing about where they were, and then speaking aloud. Bruin would nearly always stand up to investigate, thus giving me a shot at his head. But now a Bear that hears a human voice, hardly ever stops to look, but gets away on the jump."[114]

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[112] Rocky Mt. Bears, p. 6.

[113] Rocky Mt. Bears, p. 6.

[114] Rocky Mt. Bears, p. 6.

His Strength and Speed

The strength of a Grizzly-bear is as might be expected from his weight. He can crush in the skull of a bull with one paw-blow.

"So powerful is the Grizzly," says Barnes, "that in the bull-rings of early California, one Bear has been known to kill 6 bulls in an afternoon. The maddened Bear would rise upon its hind legs as the bellowing bull with lowered head would come upon him; and then, at a favourable moment, the Bear would strike the bull dead with a blow between the eyes."[115]

Cattlemen everywhere attest that a Grizzly can *carry off* the carcass of a steer. Which means that it can, and does occasionally, drag it half a mile or more. Similar instances are on record where the carcass was that of a full-grown Buffalo. The New Mexican cowboys who described to me the scene which I used in the lassoing of "Monarch" said that on that occasion one blow of the Bear's paw disabled a Horse. The various incidents of Grizzly strength that are used in my stories of Wahb and Monarch are gathered from life and authenticated by numberless observers.

In the Yellowstone Park, I was witness of a quarrel between a Grizzly and a very large Blackbear (the mother of Johnny). The Grizzly, with a blow of his paw, hurled her a dozen feet against a pine root, and ended all her desire for martial glory.

My California friend, Lou Ohnimus, was one of a bunch of cowboys who surprised a Grizzly in the open and tried to rope him. For some time the Grizzly eluded them by slipping off the noose each time. But at length two lariats were tight on his neck, the Horses braced, but the Grizzly brought all his mighty force to bear, and, in spite of the choking, dragged the two Horses after him. The men saw how hopeless was the battle and let the Grizzly go.

Those of us who have tried to handle a dead Moose, will appreciate the following from the pen of Henry Bannon, the well-known sportsman: "My companion had spent parts of the latter portion of the winter trapping Marten and Mink on the Clearwater River.

"In February, he had seen a Moose break through the ice and drown while attempting to cross the river. On Apr. 25th, he made note that the body of the Moose was still in the driftwood where it had lodged. He advised me of the occurrence when we were about a mile from the spot, and we hurried on with increasing vigilance.

"Soon we came on the recent tracks of a big Grizzly that must have gone directly towards the place. When we came within view of the drift-

[115] Mamm. Utah, 1922, p. 129.

wood, I carefully examined it and all its surroundings through binoculars, but nothing seemed to be moving and no object that looked like a Bear could be seen. A small clump of cottonwoods stood near the driftwood, and we suspected that the Bear had dragged the Moose out of it through the water to the shore. He had fed on part of the carcass, and later had dragged the remainder about 100 yards away and eaten it. Not a bone remained; the remnants were a few bunches of hair only.

"As we were too late, I had to learn my lesson from inference. Here was an illuminating illustration of the mighty strength of a mature Grizzly. I have been reliably informed of an instance in which three men were unable to drag a dead Moose from a stream, even failing to lift it with block and tackle."[116]

Similar evidence in even more picturesque detail is furnished by Roosevelt as follows: "On two other occasions, the Bear was working around a carcass preparatory to burying it. On these occasions I was very close, and it was extremely interesting to note the grotesque, half-human movements, and giant, awkward strength of the great beast. He would twist the carcass around with the utmost ease, sometimes taking it in his teeth and dragging it, at other times grasping it in his fore paws and half lifting, half shoving it. Once the Bear lost his grip and rolled over during the course of some movement, and this made him angry, and he struck the carcass a savage whack, just as a pettish child will strike a table against which it has knocked itself."[117]

In addition to its muscular strength, the Grizzly is tenacious of life. With wounds in all non-vital parts, it can and will fight, and, for the reason that its vitals are well protected, it is hard to kill. Nevertheless, a shot through the heart will drop it within a few yards, and a shot in the spine or brain will down it instantly and finally on the spot. But it will be seen how little chance of success against the Grizzly had the Indian armed with bow and lance, or even with musket and flintlock gun.

Swift, too, is he, in amazing measure for his build. Those who form their idea of a Bear's speed from watching a hulking slouching prisoner, are sure to be amazed at the real thing. For 50 or 100 yards, a Grizzly can go as fast as a good Horse, and in rough country it can go faster than any Horse, and keep it up indefinitely. It is well known that in the spring of the year the Indian ponies that have wintered out and are poor, very commonly become the prey of the Grizzly, who can now catch them on the open plain. Townsend tells of a wounded Grizzly that pursued closely a

[116] Forest & Stream, Dec., 1921, p. 539.

[117] Trail and Camp-fire, The Bear's Disposition, pp. 235–36.

man on horseback for half a mile, snapping at the Horse's heels, and apparently would have captured the object of his wrath but for a timely volley from the man's comrades.[118]

J. M. Mackenzie describes the famous Grizzly Clubfoot as able to keep pace with a Horse going downhill, but not uphill.

In view of this, it will be seen how absurd it is for any man to think that he may escape from a Grizzly by simply running.

Wright says, "the Grizzly can outrun the Blackbear by nearly half, no man can match him in speed, and it takes a mighty good Horse to catch him."[119]

Never Climbs: Swims

But one escape from the Grizzly has the Blackbear: the Monarch never climbs. Adams thought it was by choice that the giant remained on the ground, and says: "Full-grown Grizzly-bears rarely climb, and rarely attempt to do so; but, sometimes, if they see the object of their pursuit climbing, they will attempt to follow."[120]

It seems that the cubs commonly and readily climb. Even a 2-year-old can go aloft when it seems desirable. But after that, the weight of evidence goes to show that a full-grown Grizzly never climbs, for the reason that he cannot. At least, this is the general impression. Nevertheless, Supt. A. E. Brown, of the Philadelphia Zoo, assured me that he once saw a tame adult Grizzly climb a small telegraph pole to the cross-trees. It had, however, to be greatly urged before it would make the attempt; and it is a fact that the wild adult does not climb. The hunter who succeeds in getting up a tree is as safe from a Grizzly as he is from a bull.

It is 25 years since Brown told me that. He is now where he cannot be consulted for fuller details. But my memory of it is that the Bear was in possession of a travelling Italian who collected coppers in the streets by making the Bear do tricks. All of which suggests that it might have been a Russian Bear, not a Grizzly.

As to Grizzly Adams's statement that Grizzlies climb, he intimates that they climb the live oaks, which means that they walk along huge and nearly horizontal trunks that are near the ground, as everyone will realize who has ever seen a California live oak.

As noted in the Life of the Blackbear, that animal often throws himself from a tree to the ground—a Grizzly never, even when young enough to

[118] Narr. Journ. Rocky Mts., 1839, p. 68

[119] Grizzly Bear, p. 198

[120] Grizzly Adams, p. 151.

climb. And never does he leap from a rock; he always finds a way to get down afoot.

This species is a good swimmer, but seems less ready to take to the water than is the Blackbear.

His Rivals

The Blackbear is a rival of the Grizzly only inasmuch as he seeks the same food. Not only is he a rival in the sense of getting there first, but also in a parasitic sense, as we may judge from the following:

James M. Mackenzie of Bakersfield, Calif., told me that Monarch, the King of Kern, was always followed by from one to a dozen Blackbears, who played Jackal to the Lion, that is, they devoured the remains of a beef killed by the King, after he had feasted. But the little one is in mortal dread of the Monarch, and, like the Cat in the fable, has one principal refuge that serves him unnumbered times—he climbs a tree whenever in danger of punishment. Thus, the Blackbear is an arboreal parasite on the terrestrial Grizzly.

But ordinarily, he avoids the places which the Grizzly has made his own. "The Blackbear," says Wright, "associates very little with the Grizzly. In some parts of the country, both kinds are to be seen on the same range, but in most places where the Grizzlies are plentiful, Blackbears are seldom seen. One spring, while hunting with a party in British Columbia, we saw 21 Bears, and not one of them was a Blackbear."[121]

Two other beasts there are, native to his realm—the only two that dare to face him in open battle: the Buffalo bull and the Mountain Lion.

I have heard many thrilling stories of bull and Bear fights, in which sometimes one and sometimes the other was victor. The most terrible of these detailed the many rounds, and finished with the Buffalo staggering off to die; his horns draped with the intestines of the disembowelled and dying Grizzly. But I cannot give any authenticating details.

J. O. Pattie tells briefly of contests in the arena in which 14 bulls were killed by 5 Grizzly-bears. These probably were Mexican range Cattle, creatures not so well equipped as Buffalo for such a combat.[122]

Though the least of the three, the Mountain Lion is probably the most formidable of all his rivals. In the Mountain Lion Life is given [123] a fight in which a Mountain Lion killed "a middle-sized brown Bear," probably

[121] Five Grizzlies.

[122] Narrative, Thwaite, 1905, p. 235.

[123] Vol. I, p. 103.

of Blackbear kinship; and again, in great detail, [124] a fight between a Lion and a Grizzly in which both perished. In this case, however, the Bear was taken unawares. There can be no doubt that ordinarily a big male Grizzly fears no creature that walks on four legs in America.

Enos A. Mills gives us a noble picture of the two kings meeting: "Before me, just at sunrise," he says, "a Grizzly and a Mountain Lion met. The Grizzly—the dignified master of the wilds—was shuffling along, going somewhere. He saw the Lion afar, but shuffled indifferently on. Within 50 feet, the Lion bristled, and, growling, edged unwillingly from the trail. At the point of passing, he was 30 feet from his trail-treading foe. With spitting, threatening demonstration he dashed by, while the unmoved, interested Grizzly saw everything as he shuffled on, except that he did not look back at the Lion which turned to show teeth and to watch him disappear."[125]

A still more obvious admission of vassalage on the part of the Lion is seen in Mills's second experience: "On one occasion, when I was hidden and watching the carcass of a Deer which a Lion had killed, to see what carnivorous animal might come to the feast, a Mountain Lion walked quietly and unalertly to it and commenced to eat. After a few minutes, the Lion suddenly bristled up and spat in the direction from which a Grizzly-bear presently appeared. With terrible snarling and threatening, the Lion held on to the prize until the Grizzly was within a few feet. He then leaped toward the Grizzly with a snarl, struck at it, and dashed into the woods. The Grizzly, without even looking round to see where the Lion had gone, began eating."[126]

In the section on *Playful Grizzlies*, is an episode by Mills, which pictures the clash of interests between a Grizzly and a Skunk. In this, the Grizzly, as do most wild folk, conceded to the Skunk the right of way.

There are yet two other enemies that should be noted—man, the all-destroying, and insects, the all-destroying. As at present seeming, these two are at war with the rest and in the end may put all others off this planet. Which of these will finally persist is a problem. For all we can at present forecast, the insects are likely in the end to triumph.

Famous Grizzlies

It would be easy to compile a volume that should record the individual Grizzlies that achieved fame in the West. Monarch the King of Kern,

[124] Vol. I, p. 90.

[125] Watched, pp. 113–14.

[126] Watched, p. 197.

Clubfoot Queen of Kern, the Ventura Sheep-killer, the Father of Old Mose, the Hager Peak Grizzly, Bigfoot, Old Mose, Old Four-toes, Old Clubfoot, the Okanagan Cattle-killer—all were famous in their conflict with man, and left records vastly more to their credit than to ours. The details are scattered through the sporting magazines and the newspapers of the West, where those who wish may find them.

Sickness

Epidemic plagues appear from time to time in most species, chiefly those that are gregarious. But so far I have no record of such things among the Grizzlies, nor, indeed, of any Grizzly dying of disease. No one has made mention of tumours, cysts, sores, skin banes, tapeworm, etc., in the Grizzly, though these are of general occurrence among other species. If the Grizzlies escape the world-sweeping "flu," they are probably alone among warm, red-blooded creatures.

The Grizzly is fond of a mud bath, even more so than is the Blackbear. His wallows are found wherever the Grizzly roams. These, no doubt, offer protection from the mosquitoes, and also, when hot weather and shedding-time arrive together, to produce a general sense of prickly heat and discomfort, the cooling, healing mud of the bath furnishes a most delicious relief. It may be considered treatment for some affections. The amount of scratching that a Grizzly does is some evidence of parasites.

In menageries, it is well known that old Grizzlies get rheumatism. In the Rocky Mountains around Yellowstone Park, the Grizzlies are known to use the abundant hot sulphur baths. Hot sulphur baths alleviate, may cure rheumatism.

These main facts are to be kept in mind: Pain is nature's protest against injury. And a good rule in taking sun-baths, mud-baths, sulphur baths, etc., is: So long as it is pleasant it is beneficial. This rule the Grizzly seems to live up to.

Snow-blind Bears

Jim Brewster, the well-known guide of Banff, Alta., has sent me the following amazing details of Bear afflictions: "Towards the latter end of May, 1906, I was hunting Bear on Middle River, a tributary of the Columbia River, B.C. Travelling on foot along the shingle flats and gravel bars of the river, I was somewhat surprised to see a Grizzly-bear coming towards me, and followed at a distance of about 30 yards by a Blackbear. The animals progressed but slowly, and in an aimless manner, repeatedly

stumbling into the furrows which scored the gravel flats. Standing quite still (the wind blew from them to me), I had ample opportunity to observe their movements.

"It was obvious that the Blackbear was following the Grizzly by scent alone. When the pair had come within easy range (they were staggering and blundering along like drunken men), I fired at and killed the Grizzly. The Blackbear, alarmed by the shot, endeavoured to make his escape by running away, but had apparently no sense of direction, and falling into holes and bumping into trees, was easily followed and shot. From their unusual actions, I had already concluded that both were blind. I made a careful examination of the eyes of both species, and found them to be badly inflamed and bloodshot. The animals were both in normal physical condition.

"Next day, I followed the route taken by the luckless pair, and found that they had, just previous to our meeting, traversed a high plateau which lay between this and the next valley. On this elevated and barren table-land, there was still a heavy covering of snow, which, at this season, is crystallized and gives off a powerful glare when exposed to bright sunlight. The distance across the snowy waste was approximately 10 miles. The weather for some days had been fine and sunny.

"I am convinced beyond doubt that the Bears were suffering from acute snow-blindness."[127]

Age

One reads of Grizzly-bears that had been the terror of such and such a range for 30 or 40 years, etc. But on what is the evidence of such great age founded? Little but guesswork.

Usually we find that a mammal normally attains an age which is 4 or 5 times the period they need to reach maturity, that is, puberty. A Grizzly-bear is fully grown and capable of breeding at 4, certainly at 5, years of age. Therefore, its life term should be about 20, or not more than 25 years.

The following evidence supports this idea; referring to a Bear in the Washington Zoo, the Director says: "A Grizzly-bear, male, received from the Yellowstone National Park July 29, 1908, died March 27, 1922. This Bear was about $3\frac{1}{2}$ years old on its arrival, lived in the park 13 years, 7 months, and 28 days, and its death was clearly due to advanced age."[128] It was about 17 years old.

[127] Letter, Apr. 20, 1925.

[128] Ann. Rep. Smiths. Inst., 1922, p. 93.

Dr. P. Chalmers Mitchell of the London Zoo writes me that "the longest record of a Grizzly Bear here is only $3\frac{1}{2}$ years." "In the case of the Grizzly," says Wright, "I have known and watched for years an individual Bear in his home mountains, that must have been more than 20 years old, and that was still in full vigour the last time I saw him. But I have never happened to keep similar track of any individual Blackbear in the open. I have, however, never seen any Blackbear that looked as old as some Grizzlies I have seen."[129]

A near kinsman of the Grizzly, a female Syrian Bear, in the Clifton Zoo, England, has been there since Mar. 14, 1894, i. e., 31 years. She was about 6 years old on arrival and even yet shows very little sign of age though 37 years old. I did not see her, but have this information from the Director, H. Reginald Woodward.

It will be seen later that a Blackbear that had reached the age of 25 was evidently very old.

Death Gulch

While the story of Wahb was published as fiction, the incidents in it were from life. The most unusual of these was the last, the death of the old Grizzly in the place of the poison gas. How near this is to the truth may be gathered from the following:

Death Gulch is a well-known small and gloomy ravine in the north-east corner of Yellowstone Park. Into this the wild things are tempted by promise of food, water, and shelter. But they are led into a bath of invisible poisonous vapour in which each, in turn, sinks down to sleep his last sleep.

Twice it has been investigated by members of the U. S. Geological Survey. In 1888, Walter H. Weed visited the place and wrote an account of it for *Science*, Feb. 15, 1899. After commenting on the volcanic origin of the gulch formation, he says: "Although hot water no longer flows from these vents, gaseous emanations are now given off in considerable volume."

Arnold Hague, his chief, was "successful in obtaining evidence of the presence of carbonic-dioxide gas" in these emanations.

Weed says: "The gulch ends, or rather begins, in a scoop or basin about 250 feet above Cache Creek, and just below this was found the fresh body of a large Bear, a Silver-tip Grizzly, with the remains of a companion in an advanced stage of decomposition above him. Near by were the skeletons of 4 more Bears, with the bones of an Elk a yard or two above, while in the

[129] Black Bear, p. 67.

bottom of the pocket were the fresh remains of several Squirrels, Rock Hares and other small animals, besides numerous dead butterflies and insects. The body of the Grizzly was carefully examined for bullet holes or other marks of injury, but showed no traces of violence, the only indication being a few drops of blood under the nose. It was evident that he had met his death but a short time before, as the carcass was still perfectly fresh, though offensive enough at the time of a later visit.

"The remains of a Cinnamon Bear just above and alongside of this were in an advanced state of decomposition, while the other skeletons were almost denuded of flesh, though the claws and much of the hair remained. It was apparent that these animals, as well as the Squirrels and the insects, had not met their death by violence, but had been asphyxiated by the irrespirable gas given off in the gulch. The hollows were tested for carbonic acid gas with lighted tapers, without proving its presence, but the strong smell of sulphur and a choking sensation of the lungs, indicated the presence of noxious gases, while a strong wind prevailing at the time, together with the open nature of the ravine, must have caused a rapid diffusion of the vapours."

Prof. T. A. Jaggar, Jr., made an examination in 1897, and in *Popular Science Monthly* for Feb., 1899, pp. 5-6, described it as "Death Gulch, a Natural Bear-trap."

"Climbing through this trough, a frightfully weird and dismal place, utterly without life, and occupied by only a tiny streamlet and an appalling odour, we at length discovered some brown furry masses lying scattered about the floor of the ravine about a quarter of a mile from the point where we had left Cache Creek. Approaching cautiously, it became quickly evident that we had before us a large group of huge recumbent Bears; the one nearest to us was lying with his nose between his paws, facing us, and so exactly like a huge Dog asleep that it did not seem possible that it was the sleep of death. To make sure, I threw a pebble at the animal, striking him on the flank; the distended skin resounded like a drum-head, and the only response was a belch of poisonous gas that almost overwhelmed us. Closer examination showed that the animal was a young Silver-tip Grizzly (*Ursus horribilis*); a few drops of thick, dark-red blood stained his nostrils and the ground beneath. There proved to be 5 other carcasses, all Bears in various stages of decay; careful search revealed oval areas of hair and bones that represented 2 other Bears, making a total of 8 carcasses in all. Seven were Grizzlies, one was a Cinnamon Bear (*Ursus americanus*). One huge Grizzly was so recent a victim that his tracks were still visible in the white, earthy slopes, leading down to the spot where he had met his death. In no

PLATE X.—DEATH GULCH
From photograph by Prof. T. A. Jaggar, Jr., July, 1897

PLATE XI.—THE OLD GRIZZLY IN DEATH GULCH
From photograph by Prof. T. A. Jaggar, Jr., July, 1897

PLATE XII.—BIG BROWN-BEARS
Washington Zoo

case were any marks of violence seen, and there can be no question that death was occasioned by the gas."

The Passing of the King

One cannot read this abundant and piled-up evidence without realizing that dignified common sense is the dominant characteristic of this grand old hermit of the hills.

What a Life is his to write! Had I had the experience of Grizzly Adams or William H. Wright, I might have done it justice. I wish I could compile their books and make but one, with orderly procession of events. Then, indeed, the reader might have an adequate presentation of the life the Grizzly lives.

The picture I form of him, with some personal experience, many camp-fire tales and much reading, is of a grand old monarch—alone, always alone—marching over the mountain-tops, dignified and unafraid—Mishe Mokwa, the Great Bear of the Mountains, feeding on every living thing that grows, from Mouse to Moose, from millet to mushroom; accustomed to deference from every wild thing, unwilling to quarrel with man, but terrible when roused to fury or revenge.

In my story of Wahb, I have aimed to picture this fearless and unaggressive old giant, asking only to be let alone. No home has he. No grown Bear has a home; that is, a den where he may always be found. But, like the Buffalo and Elk, he sleeps wherever night finds him. The mountain range is his home.

Retiring he always was, feeding or travelling chiefly by night and sleeping when the sun was high. A distinct dislike of public notice he always had; but more than ever to-day. For man, aggressive, brutal, and destructive, has forced him to change many of his ancient habits. The heedless Bear that roamed the open and fed by day, is gone. His place is taken by Bears that feed secretly, silently, by night, in cover—always secretly.

The Buffalo-killer, usually a rare and sporty individual, is gone, he has given place to the Cattle-killer.

But the Cattle-killer, too, is marching on the sundown trail. A great shrinkage of the Big Bear's range is seen to-day, and a woeful change in the Bear himself. All the old travellers, from Lewis and Clark to those of 40 years ago, aver that the Grizzly had little fear of man, and ofttimes claimed and received from him the right of way.

We have lived to see another mind in the king of the Ranges; we find in him now the exemplar of an ancient law: The beasts are shy in proportion to their bigness, that is really in measure of man's eagerness to add

them to his bag. The Mouse will let you walk up within a few yards, will even run over your foot if you are still; the Moose will flee on the slightest intimation that man is within a mile. And the Grizzly, too, accepts the common creed. No longer the arrogant despot of all trails and ranges, he has retreated to secluded fastnesses, to wild and inaccessible regions of thicket and mountain-side. He is changed in temper as in life, and the faintest whiff of man-scent now is enough to drive him miles away.

And what is it that has made this change—that has turned the heart of the mountain terror and made him shyer than ever Fawn or Hare? The educating force was *modern guns*. Repeating rifles have instilled the idea that man is master—omnipotent, merciless—therefore, shun the onset that can end in only one way. The fallen monarch is become a fugitive in his own kingdom. In many parts of the country, particularly the South and East, his kind is extinct. In a little while he will have left the United States, or will continue only as a pensioner in the Yellowstone Park. And I, for one, would gladly see the total abolition of all bounty laws on the Grizzly's head. I should welcome a movement to prevent his extermination. His day and sceptre are gone; right well he knows that; he is harmless now, and is, moreover, a magnificent animal, whose extinction would be just such a loss to zoology as the destruction of St. Peter's would be to the world of art.

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LIFE XVII—THE BARREN-GROUND GRIZZLY

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Barren-ground Grizzly

Ursus richardsoni Swainson

(In honour of Dr. John Richardson who first collected and described the species)

Ursus richardsoni SWAINSON, 1838, Animals in Menageries, pp. 54–56.

TYPE LOCALITY—Shore of Arctic Ocean, on west side of Bathurst Inlet, near mouth of Hood River

WESTERN ESKIMO, *Aklak* (R. M. Anderson).
COPPER ESKIMO, *Akshak;* plural, *Aklat* or *Akshat.* (R. M. A.)

Compared with other Grizzlies, the characters of *richardsoni* are: "Size, medium; colour, variable, from yellowish to grizzly brown; fore claws of medium length, smooth; skull, medium or small, with broadly spreading zygomata."[1]

What must be considered the type specimen of *richardsoni* is thus described by Dr. John Richardson:[2] "An old and lean male, killed on the shores of the Arctic Sea, on the 1st of August, 1821, was of a nearly uniform yellowish-brown colour, except on the forehead and back, where the tips of the fur were paler. The fur, which was straight, and of the fineness of coarse wool, was giving place to a thin coat of blackish hair. Its forehead was broad, and slightly convex, and the arch of the orbit rose conspicuously at the root of the nose, which was straight. The legs were long, and the claws, of an intermediate size between those of the Black and Grisly Bears, projected beyond the hairs, and were more pointed than the claws of the latter.

"The dimensions of this individual were as follows:

"Length from muzzle to root of tail	5′	2″
" of tail	0	6
Height from sole of fore foot to top of shoulder	2	9
" of hind quarters	2	6
Length of muzzle from nostrils to anterior angle of eye	0	6
" from anterior angle of eye to centre of auditory opening	0	10
Distance from tip of one ear to tip of other	0	10

[1] Merriam, Review, p. 99.

[2] F. B. A., I, pp. 23–24.

Breadth of fore foot, which was nearly circular . . . . . 0′ 6″
Length of sole of hind foot . . . . . 0 10 ″

The Barren-ground Grizzly, or group of Grizzlies, calls for special treatment, chiefly because of its geographical isolation from the others of its near kindred. Strange to say, it was the first Bear to be seen and recorded by a white man, under the name "Grizzly." As noted in the History of the Grizzly (Life XVI), Umfreville and Hearne both speak of the species by name; the former, of the Saskatchewan race; the latter of the Barren-ground race, as he saw it in Coppermine River country, in July, 1771.

Merriam credits the Barren-grounds with several forms of Grizzly, and Dr. R. M. Anderson, writing of the Langton Bay region, says: "The Bears here showed two very distinct types, which, for convenience, we designate as the long-snouted and short-snouted types. The skulls are readily separated on this basis. It is rather hard to distinguish them by colour, as late summer skins are usually much bleached out. In general, the long-snouted Bears were inclined to a reddish-brown cast of colour (sometimes almost bay colour), while the others were often very dark—dusky brown, with tips of hairs on dorsal surface light grayish brown or fulvous, sometimes with tips a faint golden yellowish tint."[3]

"Dr. C. Hart Merriam identified most of the specimens from the Franklin Bay and Horton River region as belonging to *Ursus richardsoni* Swainson, but he provisionally refers two specimens to *Ursus crassus* Merriam, Thickset Grizzly, the type locality of which is upper Macmillan River, Yukon. These are in the collections of the American Museum of Natural History, New York.

"Several specimens collected by the Canadian Arctic Expedition in 1915 and 1916, from Dolphin and Union Strait to Bathurst Inlet, are referred to *Ursus richardsoni* Swainson, but one specimen taken by Eskimos at Stapylton Bay, on south side of Dolphin and Union Strait, in Sept., 1915, he refers to *Ursus macfarlani* Merriam, MacFarlane Bear. A fine adult male specimen which we took within a few miles of the type locality of *richardsoni*, Baillie's Cove, near mouth of Hood River, Aug. 28, 1915, he identifies as *richardsoni* (not published)."[4]

Range and Scarcity

It is generally understood that "Great Bear Lake" connotes the fact that it is in the heart of the range accredited to this species.

[3] Stefansson, Eskimo, p. 521.

[4] R. M. Anderson, personal letter.

On July 8, 1771, Samuel Hearne camped at a place called "Grizzle Bear Hill, which takes its name from the numbers of those animals that are frequently known to resort thither."[5] This hill is on the Coppermine River, about 100 miles south of Coronation Gulf.

Later in the same month (17th), Hearne "saw the skin of an enormous Grizzled Bear at the tents of the Esquimaux at the Copper River."[6]

Franklin writes under date of August 14, 1820, when south of Fort Enterprise, at Lat. 64° 6′ 47″, Long. 113° 25′ 0″: "Previous to his departure, the chief warned us to be constantly on our guard against the Grizzly Bears, which he described as being numerous in this vicinity [Grizzle Bear Lake], and very ferocious; one had been seen to-day by an Indian, to which circumstance the lake owes its appellation."[7]

Richardson, in whose honour the species was named, says: "The Barren Lands, however, lying to the northward and eastward of Great Slave Lake, and extending to the Arctic Sea, are frequented by a species of Bear, which differs from the American Blackbear in its greater size, profile, physiognomy, longer soles, and tail; and from the Grisly Bear also, in colour and the comparative smallness of its claws."[8]

Roderick MacFarlane, who collected in and about Fort Anderson, 1861 to 1866, records that "this Bear is not uncommon in the Barren Grounds of the Anderson region, nor on the polar shores of Franklin Bay, where, apart from a few exported skins, we annually secured during our 5 years' sojourn at Fort Anderson one or two examples, with the skulls and skeletons suitable for museum purposes."[9]

Warburton Pike in 1889–90, and J. B. Tyrrell in 1898, covered part of the Barren-grounds without seeing any of the Big Bears.

E. A. Preble writes: "During the explorations conducted by J. W. Tyrrell in the region between Great Slave Lake and Hudson Bay, in the summer of 1900, tracks of a large Bear, undoubtedly of this species, were seen on two occasions on the Thelon, and one was killed by Fairchild, a member of the party. This specimen, unfortunately, was lost in a canoe accident.

"During the same season, J. M. Bell, while exploring in the Great Bear Lake region, met with this species. He writes me that he saw 'Grizzly

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[5] Journey, p. 139.

[6] As above, pp. 371–72.

[7] Narr. Journ., p. 220.

[8] F. B. A., I, p. 21.

[9] Mamm. of Northern Canada, p. 216.

Bears, large grayish-brown brutes, quite often along the west and north shore of Great Bear Lake.'"[10]

David T. Hanbury, when on the Coppermine in 1899, wrote: "My Huskies discovered and brought me a large bone which could only have belonged to a very large Bear, probably a Grizzly. There are 'Barren-ground Bears' all along the Arctic coast from Kent Peninsula to the Coppermine, but they are not numerous. At several places I came across their 'hooking' for roots, occasionally quite fresh, but none of our party happened to get a sight of a live Bear."[11]

"On reaching the coast near Ogden Bay, early in May, 1902, he learned from the Eskimo that the animals occur all along the Arctic coast, though not numerously, but that they do not emerge from their winter quarters until June. Proceeding westward, he noted tracks in several places between there and Great Bear Lake, but saw none of the animals. He saw the last fresh tracks on the north shore of Great Bear Lake, near the mouth of Haldane River, late in August."[12]

"Mr. Peter McCallum, who has spent some years about Great Bear Lake, informed me that the region of the Scented Grass Mountains, locally known as the 'Big Point,' is a favourite locality for the animals."[13]

In 1907, when I entered the region as far as Sussex Lake, Headwaters of Back's River, I found no trace of the species.

For the largest recent accession to our knowledge of this Bear, we have to thank Dr. R. M. Anderson of the Canada Geological Survey. In 1908, he went on the Stefansson-Anderson Arctic Expedition of the American Museum, to the polar coast of the Canada mainland. His report appears as an appendix in Stefansson's "My Life with the Eskimo," published 1913, as follows: "Brown Bears, or Grizzlies, are found sparingly throughout the Arctic mainland from western Alaska to Coronation Gulf. There are undoubtedly two or three races or species in this region, but, owing to lack of specimens from important localities and lack of time for critical examination of the material at hand, I am obliged to nominally refer to the Arctic Brown Bears under the above heading. In northern Alaska, they do not appear to be very common on the north side of the Endicott Mountains, and seldom, if ever, come out on the coastal plains. The inland Eskimo occasionally kill specimens, and often use the skin for a tent door. I saw the skins of two which were killed on the Hula-hula River, in October,

[10] N. A. F., 27, 1908, pp 224–25.

[11] Sport and Travel in the Northland of Canada, 1904, p. 199.

[12] Preble, N. A. F., 27, p. 225.

[13] As above, p. 224.

1908, by a Colville River Eskimo named Auktel lik. Auktel lik told me he had killed 44 Aklak [Pl., *Aklat*] in his time, and that only 2 of the lot came towards him, and tried to attack him. From what I could learn, he had not hunted very far west of the Colville, or at all east of the Mackenzie. Most Eskimo, however, speak with much greater respect of the pugnacity of *Aklak* than of *Nannuk* (the Polar Bear), and are much more cautious about attacking him.

"On July 3, 1912, Mr. Frederick Lambart, Engineer on the Alaska-Yukon Boundary Survey, shot a Brown Bear on the Arctic slope of the mountains on the 141st meridian, about 45 miles from the Arctic Ocean at Demarcation Point. From 3 photos of the dead Bear, it appeared to be of the long-nosed type, with a pronounced hump on the shoulders. Mr. Lambart informs me that this Bear has been examined by Dr. C. Hart Merriam, and declared to be a new species hitherto undescribed [*Ursus internationalis*]. In the Mackenzie delta, tracks of Brown Bears are occasionally seen, but the Bears are seldom killed, owing to the impracticability of hunting them through the dense underbrush on the islands in summer.[14]

"A few Bears were met with in the Coppermine country, but throughout the Coronation Gulf region, they are apparently rare. The Eskimo say that the *Aklak* is not found on Victoria Island.[15]

"We found the centre of greatest abundance of the Barren-ground Bears in the country around Langton Bay, and on Horton River, not more than 30 or 40 miles south from Langton Bay. One was killed at Cape Lyon, and another on Dease River east of Great Bear Lake. In this region our party killed about 20 specimens, most of which were obtained on our dog-packing expeditions in early fall."[16]

The Labrador Grizzly

An interesting experience is awaiting some enterprising collector who will go to Labrador and bring us a skull and skin of the Labrador Grizzly. Apparently, it has never yet been seen alive by white men. And yet, it is, or was, there, as the following records attest: "Barren-ground Bear, *Ursus arctos* (Richardson). This Bear is found in the Barren-grounds south of Hudson's Strait. Capt. William Kennedy, who was formerly agent of the Hudson's Bay Company in the Ungava District, informed me that the skins they got there resembled those of the Grizzly Bear closely enough to pass as a variety of this fur in the trade. Some of the Hudson's Bay Company's

[14] Preble, N. A. F., 27, pp. 519–20.

[15] P. 521.

[16] P. 520.

officers regard the Barren-ground as a variety of the Cinnamon Bear. In the barren grounds to the northwest of Hudson's Bay, I have been told that a large Bear is found, which the Eskimo consider a variety of the Polar Bear, which has adopted a terrestrial life, and to which they have given the name of 'blue' or 'grey' Bear."[17]

In "Mammals of Labrador," O. Bangs says: "Although no specimens have ever found their way into collections, there is no longer any doubt that a huge Bear is found in the barrens of Labrador. Low says the Mascaupee Indians have many tales of its size and ferocity. I can see no reasonable doubt that this Bear is the *U. richardsoni*."[18]

Dillon Wallace writes that at Ungava "there is a story of a very large and ferocious Brown Bear, that tradition says inhabits the barrens to the eastward toward George River. Mr. Peter McKenzie told me that many years ago, when he was stationed at Fort Chimo, the Indians brought him one of the skins of this animal, and Ford at George River said that some 20 years since, he saw a piece of one of the skins.

. . . . . .

"I am inclined to believe that the Brown Bear, so far as Labrador is concerned, has been exterminated."[19]

Habits

There is no reason to suspect the Barren-ground Grizzly and its kin of habits differing from those of its relatives farther south, except so far as is imposed by different surroundings. The following notes were made by those who knew the creature in its home, and furnish all we know on the subject:

Hearne, pioneer in so many fields of thought, writes on July 8, 1771, when on the upper part of the Coppermine River: "The place where we lay that night is not far from Grizzled Bear Hill; which takes its name from the numbers of those animals that are frequently known to resort thither for the purpose of bringing forth their young in a cave that is found there.

. . . . . .

"On the side of the hill that I went to survey, there is a large cave which penetrates a considerable way into the rock, and may probably have been

[17] Mammals of Hudson's Bay & Labrador, by Dr. R. Bell, App. II, p. 51DD of Can. Geol. Surv., 1885.

[18] American Naturalist, July, 1898, p. 500.

[19] Long Labrador Trail, 1908, pp. 236–37.

the work of the Bears, as we could discover visible marks that some of those beasts had been there that spring."[20]

Dr. R. M. Anderson, who studied the fauna of the Arctic Coast of Canada, says that "While ascending the Horton River, [which runs into the Arctic near Cape Bathurst,] we saw at intervals the nearly fresh tracks of 3 Barren Ground Bears on Dec. 29, 1910, and Jan. 1, 1911, going along the river, and over the shortest portages, at least 40 miles in approximately a straight line. Neither the Eskimo or the Slavey Indian who were with us had ever before seen evidences of Brown Bears out of their holes in mid-winter. They seem to be nearly as fat on their first emergence from their long sleep as in the fall, but speedily lose weight, and early summer specimens are invariably poor."[21]

"The Barren Ground Bears go into hibernation about the first week of October, and come out early in April while the weather is still very cold."[22]

"The fact that the Barren Ground Bears seem to always have at least 2 cubs at a birth, that old Bears are often seen followed by 2 young cubs and one yearling cub, and that we never saw more than one yearling cub accompanying its mother, is evidence that there must be considerable mortality among the cubs in the first year, probably during the second spring. The new-born cubs, of course, are nursing in the spring, while the older cubs presumably have to depend upon their own foraging. Otherwise these Bears have practically no enemies besides man. As there is little market for their skins, neither Eskimo nor Indians make any special effort to hunt them, the specimens obtained being in general upon summer Caribou hunts."[23]

Feeds Like Its Kind

Hearne, after commenting on a cave which the Indians showed him on Grizzled Bear Hill, says: "This, though deemed very curious by some of my companions, did not appear so to me, as it neither engaged my attention, nor raised my surprise, half so much as the sight of the many hills and dry ridges on the east side of the marsh, which are turned over like ploughed land by those animals, in searching for Ground-squirrels, and perhaps Mice, which constitute a favourite part of their food. It is surprising to see the extent of their researches in quest of those animals, and still more to view the enormous stones rolled out of their beds by the Bears on those occasions.

[20] Journey, p. 139.

[21] Eskimo, p. 521.

[22] As above, p. 521.

[23] As above, p. 522.

At first I thought these long and deep furrows had been effected by lightning; but the natives assured me they never knew anything of the kind happen in those parts, and that it was entirely the work of the Bears seeking for their prey."[24]

According to Franklin, "Dr. Richardson found in the stomach of this animal the remains of a Seal, several Marmots (*Arctomys Richardsonii*), a large quantity of the licorice root of Mackenzie (*hedysarum*) which is common on these shores, and some berries. There was also intermixed with these substances a small quantity of grass."[25] To this, Dr. J. Richardson adds: "Many long white worms adhered to the interior of the stomach which held this farrago."[26]

The miscellaneous nature of their diet is thus set forth by Anderson, who says it "is to a large extent vegetable. Although the Bear's native heath is often conspicuously furrowed in many places by the unearthed burrows of Arctic Spermophiles (*Citellus parryi* or *C. p. kennicotti*) I believe that the Bear's search is more for the little mammal's store of roots than for the little animal itself. The Bear's stomach is much more apt to contain *masu* roots (*Polygonum* sp.) than flesh. A Bear must needs be very active to catch enough Spermophiles above ground in spring and early summer, and if carcasses are not to be found, the Bears evidently suffer most from hunger at this season, when they can neither dig roots for themselves in the frozen ground, nor dig out the Spermophiles and their caches.

"One specimen [described as *Ursus andersoni* Merriam] was killed by an Eskimo of our party on Dease River, east of Great Bear Lake, after the Bear had gorged himself on a cache of Caribou meat, having more than 50 lbs. of fresh meat in his stomach."[27]

H. F. J. Lambert, who was on the Boundary Survey between Canada and Alaska in 1912, adds the following unvegetarian item: "I have definitely proved to my own satisfaction that the Brown and Grizzly Bears prey upon the Sheep (*Ovis dalli*) at the southern end of the boundary where they are found in large numbers, but here at the northern end where the Sheep are very scarce, no signs of their having been attacked or preyed upon were seen."[28]

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[24] Journey, pp. 140–41.

[25] Narr. Journ., 1823, p. 378.

[26] F. B. A., I, p. 23.

[27] Eskimo, p. 521. Described as *Ursus andersoni* Merriam, Anderson's Bear, in "Review of the Grizzly," N. A. F., 41, 1918, pp. 83–84.

[28] Hunting the Barren-Ground Grizzly on the Shores of the Arctic, *Can. Field Nat.*, Oct., 1919, pp. 77–78.

Ferocity When Wounded

There is not a sentence on record concerning the temper of this Bear, that might not have been written with equal truth for any other member of the Grizzly group.

Shy and wary, seeking to be let alone by man, but dangerous, desperately dangerous, if wounded and at bay.

Sir John Richardson relates: "By Mr. [Chief Trader, John] Bell, I was also informed of the melancholy death of an Indian in the vicinity of Fort Good Hope. This poor man, having set several snares for Bears, went to visit them alone. The event showed that he had found a large Bear, caught by the head and leg, and endeavoured to kill it with arrows, several of which he shot into the neck of the animal. He seems to have been afraid to approach near enough to give full effect to his weapons, and the enraged Bear, having broken the snare, flew upon him and tore him in pieces. The man's son, a youth of about 16 years of age, becoming alarmed by the lengthened absence of his father, took his gun, and went in quest of him, following his track. On approaching the scene of the tragedy, the Bear hastened to attack him also, but was shot by the lad as he was rushing at him. The boy found his father torn limb from limb, and mostly eaten, except the head, which remained entire. The Bear, whose carcass was seen by Mr. Bell, was a brown one, and of great size. Fragments of the snare remained about his neck and leg.

"These Brown Bears are very powerful; and the same gentleman who told the above story informed me that on the Porcupine River, to the west of the Peel, he saw the footmarks of a large one which, having seized a Moose-deer in the river, had dragged it about a quarter of a mile along the sandy banks, and afterwards devoured it all but part of the hind quarters. The bones were crushed and broken by the animal's teeth, and, from their size and hardness, Mr. Bell judged the Moose to have been upwards of a year old, when it would weigh as much as an ox of the same age."[29]

Dr. R. M. Anderson, in the same vein writes: "I have been warned many times by natives against shooting at a Barren-ground Bear unless from above—as a wounded Bear has greater difficulty in charging uphill. So far as our experience goes, however, the Barren-ground Bear is an inoffensive and wary brute, preferring to put as much ground as possible between himself and human society. I saw but one unwounded Bear come towards me, but as he did not have my scent, his advance was perhaps more from mere curiosity than from hostility. As the Bear was on the un-

[29] Arc. Search, I, pp. 217–18.

inhabited coast between Cape Lyon and Dolphin and Union Straits, and he had probably never seen human beings before, this inference seems plausible. Wounded Bears are another story, and it is generally admitted that the Barren-ground Bears are tougher or more tenacious of life than the Polar Bears."[30]

A Soft Answer

An appropriate tailpiece to these various pictures of the monster's behaviour is found in Richardson's description of an old Indian's peaceful adventure. It carries a moral of quite wide application: "The Indians dread the Barren-ground Bears, and are careful to avoid burning bones in their hunting encampments, lest the smell should attract them. Keskarrah, an old Indian mentioned in the Narrative of Captain Franklin's first Journey, was seated at the door of his tent, pitched by a small stream not far from Fort Enterprise, when a large Bear came to the opposite bank, and remained for some time apparently surveying him.

"Keskarrah considering himself to be in great danger, and having no one to assist him but his aged wife, made a speech to the following effect: 'Oh! Bear, I never did you any harm; I have always had the highest respect for you and your relations, and never killed any of them except through necessity. Go away, good Bear, and let me alone, and I promise not to molest you.'

The Bear walked off; and the old man, fancying that he owed his safety to his eloquence, favoured us, on his arrival at the fort, with his speech at length."[31]

References for Barren-ground Grizzly

1795—Journey to Coppermine River, by Samuel Hearne.

1823—Narrative of a Journey to the Shores of the Polar Sea, by Capt. John Franklin.

1829—Fauna Boreali Americana, by Sir John Richardson, I.

1851—Arctic Searching Expedition, by Sir John Richardson.

1905—Notes on Mammals Collected and Observed in the Northern Mackenzie District, Northwest Territories of Canada, by R. MacFarlane, Proc. U. S. Nat. Mus., Vol. XXVIII.

1913—Report on the Natural History Collections of the Expedition, by R. M. Anderson, in Stefansson's "My Life with the Eskimo" (herein cited as Eskimo).

[30] Eskimo, p. 520.

[31] F. B. A., I, p. 22.

LIFE XVIII—GIANT BROWN-BEAR

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Giant Brown-bear, Kadiak Bear, Peninsula Giant Bear, Big Brownie, Great Fish-bear of Alaska, St. Elias Grizzly

Ursus gyas Merriam

(Gr. *gyas*. gigantic)

Ursus dalli gyas Merriam, 1902, Proc. Biol. Soc. Wash., Mar. 22, p. 78.

Type Locality—Pavlov Bay, Alaska Peninsula

Size. This is the largest carnivorous animal living in the world to-day. Total length, about 8 ft. (2440 mm.); tail, about 4 in. (102 mm.); length of hind foot, 16 in. (406 mm.); width of hind foot, about 8 in. (203 mm.); height at shoulders, about 52 in. (1322 mm.).

On June 2, 1918, Robert H. Rockwell, of Brooklyn Museum, got a very large dark ♂ Bear on Alaska Peninsula, which measured as follows:

	Feet	*Inches*
Skull	1	6½
Length of skin	10	6
Height at shoulder; leg in standing position	4	0
Width of fore paw pad by calipers		8½
Length of hind foot	1	2½
Girth of neck, skinned	3	5
Snout to crotch, straight	7	10
Girth of chest, skinned	5	7 [1]

This is very near a record in size.

Weight. About 1,500 lbs. Another, killed by Dr. J. Wylie Anderson, in June, 1909, on Unimak Island, weighed 1,320 lbs.[2]

Rowland Ward's "Records of Big Game," 1922 ed., p. 502, gives the following: Kadiak Bear, length of skin, 13 ft. 6 in.; weight, 1,656 lbs.; T. C. Tolmer, owner. Another on same page, skin, 11 ft.; height at shoulder, 4 ft.; weight, 1,460 lbs.; J. Wylie Anderson, owner. Another on same page, length, 7 ft. 9½ in.; length of skin, 9 ft. 4 in.; weight, 1,014 lbs.; Capt. C. R. E. Radclyffe, owner.

[1] Forest & Stream, March, 1922, p. 134.

[2] Outdoor Life, Dec., 1909, p. 541.

On May 24, 1901, on the Alaska Peninsula, a little Brown-bear cub was caught. He was evidently about 5 months old, and weighed 18 lbs. He reached the National Zoo at Washington, Jan. 9, 1902, was then 1 year old, and weighed 180 lbs. He lived $12\frac{1}{3}$ years in the Zoo, and died from rupture of blood vessels, Sept. 30, 1914. He stood 50 in. high at the shoulder, and could take an apple from the end of a stick held at the height of 9 ft. 3 in. Nearly every year he was weighed, and the following shows his annual growth: 18, 180, 450, 625, 770, 970, 1,050. ——, ——, 1,200 (estimated), ——, ——, 1,020 lbs.

This was the largest Bear that was ever in that Zoo, though not large for a Brown-bear. He was a very active animal, and William H. Blackburne, the head keeper, was careful to avoid overfeeding, so that the Big Brown fellow was never over-fat; yet, in 1910, he surely weighed 1,200 pounds.

The female is much smaller.

Colour. Very variable, from grizzled brown to golden brown or pale yellowish, but usually uniform over the body. In some forms, nearly black.

Races

In Merriam's *Review*, already cited, the following Big Brown-bears are listed, chiefly on the strength of the skull characters:

gyas Merriam, as above, of largest size; grizzly brown and yellowish. T. l., Pavlof Bay, Alaska Pen.

dalli Merriam, of medium size; dark brown colour, strongly grizzled. T. l., Yakutat Bay, Alaska.

middendorffi Merriam, much like *gyas*, but very high skull. T. l., Kodiak Island, Alaska.

kenaiensis Merriam, large and dark; looks like a big, yellowish Grizzly, with darker legs and feet. T. l., Cape Elizabeth, at extreme west end of Kenai Pen., Alaska.

sheldoni Merriam, large; teeth and claws of Grizzly type; colour variable, from dark to light brown. T. l., Montague Island, Prince William Sound, Alaska.

nuchek Merriam, large; external characters unknown. T. l., head of Nuchek Bay, Hinchinbrook Island, Prince William Sound, Alaska.

sitkensis Merriam, size, large; colouration, very dark; claws of moderate length, curved, dark blue, black, scurfy; skull broad and massive. T. l., near Sitka, Alaska.

shirasi Merriam, like *sitkensis*, but larger, and black, with brown muzzle. T. l., Pybus Bay, Admiralty Island, Alaska.
(According to Osgood, *hoots* is a grizzly.)

It is amazing that this largest of all flesh-eaters should have remained so long unknown to science, though known to travellers for a hundred years, and famous among hunters as the "St. Elias Grizzly." In 1806, G. H. Von Langsdorff, writing from Norfolk Sound, Sitka, says that there were Brown-bears there, he had examined their skins, and they were very different in size, colour, and nature from those of the Blackbear.[3]

Notwithstanding this valuable hint, no one investigated the Big Brown-bear until 1896, when Merriam made the first formal introduction of these Big Bears to science, by describing *middendorffi*, *dalli*, and *sitkensis*. To these, other names were added by the same author, and finally in his 1918 *Review*, already cited, the number of forms was raised to 9.

Life History

With at least 9 forms of Alaskan Brown-bear listed, and no material but the scattered notes of hunters, it seemed a hopeless task to attempt a life history of even one representative of the group. It proves, however, less formidable than it seemed Charles Sheldon, one of our best authorities, after having had ample opportunity to make observations on one or two forms, says: "Nothing is more striking than the general similarity in nature, actions, appearance, and habits of both the Brown-bears of the humid coast region of Alaska, and the Grizzlies of the dry interior. The several species of both these coast and inland Bears differ more or less widely in size, anatomy, colour, and claws, but no one can observe them in their natural habitats without realizing that all have descended from a common ancestor."[4]

Again he says, "The habits of all the Brown-bears, both on islands and mainland, except when varied to such local conditions, are similar."[5]

Range and Haunts

A glance at the map shows that this surprising array of Big Brown-bears is limited to a long, narrow strip; that is, the Pacific coast region of Alaska, from the Alaska Peninsula nearly, or quite, to British Columbia. The limits of the ranges of the various forms are unknown, and will remain

[3] Voy. & Trav., 1814, II, p. 103.

[4] Wild. Nor. Pac., p. 232.

[5] As above, p. 232.

so till many more skulls and skins have been assembled. Merriam had hundreds, but not enough.

Gyas, he credits with a range that includes the entire length of Alaska Peninsula, from Cook Inlet to Isanotski Strait, and adjacent Unimak Island.

The freedom of every kind of rough country in his range is claimed by the Big Bear. Be it rugged mountain-side, sea-marsh, upland moor, brawling salmon river in the spruce woods, snowfield, crawling glacier hedged with rock moraine, alder swamp, or flowery meadow, he accepts them all. He is happy so long as he can find his varied food and be within smell of the ever-sounding sea; for salty air he seems to need, and in no part of his long, narrow range is he beyond its influence.

There are, perhaps, but two environments that do not win his soul—one, the bleak crags of his sky-high friend, the White Goat; the other, the heaving surf and broken ice, frequented by Seals, and that are loved by the Polar Bear.

Home Range and Trails

Usually, an animal's home range is in ratio to its bulk. Thus, a Mouse may spend its entire life in a space 100 yards each way; a Bobcat may need a mile square; and the range of a Big Bear may be 20 miles across. He knows the possibilities of the region possessed. He knows what weather such and such a place imposes, that the western slope has the eternal ocean wind, that the eastern slope has the warming sun of early day, that the bleak upland at least is clear of flies, that the sheltering swamp is pestilent with stingers. He knows where stretch the large snowfields on which to lie when the sun is hot or the flies too troublesome. He knows what food is at another place. He knows where the sea-kelp is sure to be heaped up after the storm, and when the salmon run is on, and the very best spots to profit by that insane myriad rush.

Many miles apart are these, his interests; but his compass gyroscope is as good as his speedometer, and the lines of travel he makes are direct and easy. Many times he uses them, so that deep-worn trails are made, and at their corners or crossroads, or on chance trees and rocks near by, he rubs his huge body and leaves the signature of tooth and claw, a notice to the world that "this place is possessed."

All hunters know these trails. Thus Sheldon writes: "Trails which Bears constantly travel over show a continuous series of single alternate footprints, worn fairly deep into the soil, since each Bear steps in the same track. Here and there, on the east side of the island, these trails lead from

the basins down the creeks, but since the footprints are worn into the ground only where it is especially soft, the trails are much broken—a fact which shows that Bears do not walk on them very often. A trail, well-defined in some places, faint in others, runs twenty or more feet inside the woods, continuously parallel with the east shore. Here, Bears travel in early summer and late fall, depending on their sense of smell to direct them to any food which may be on the beach. Edmund Heller, who accompanied the Alexander expedition to Montague Island in 1908, advises me that there is a similar trail in the woods, near and parallel with the beach, on the west shore of the island. This habit of travelling as much as possible under cover demonstrates the Bear's caution, which always increases when it leaves the higher country. Both in Alaska and Yukon Territory, I have observed that Bear trails along the salmon rivers are always made well back from the bars, where the Bears can walk without being exposed to sight."[6]

Numbers

L. L. Bales, the well-known Alaskan hunter, says that the Big Bears are still (1916) plentiful at Port Mohler, Nelson's Lagoon, and Bear Lake, on the Bering Sea side of the Alaskan Peninsula, and at Pavlof Bay, Stepovak Bay, and Cape John, on the Pacific side of the same peninsula; also on Kadiak Island.[7]

Dan J. Singer says that some of the best places to hunt these Big Bears are on Admiralty, Baranof, and Chichago Islands, outfitting from Juneau. But for Cook's Inlet, he recommends Chinitna Bay and Snug Harbour.[8]

Sheldon considered them as "abundant" in 1912 on the mainland north of Lynn Canal.[9]

When one says that these Bears are "numerous yet" in some regions, it means that in a day's march, one may see many tracks; and in a week's hunting, may find 3 or 4 Bears.

In a hunt begun May 13th, and ended June 3, 1921, Robert H. Rockwell, of Brooklyn Museum, collected 17 Big Bears on the Alaska Peninsula.[10]

In the early days of the '80's, one could count on seeing 3 or 4 Bears in a day. But, alas, the usual hideous story is being repeated. In 40 years, the Great Bears have fallen from "abundant" to "scarce," except in a few rugged regions. A slight increase may have taken place in the last few

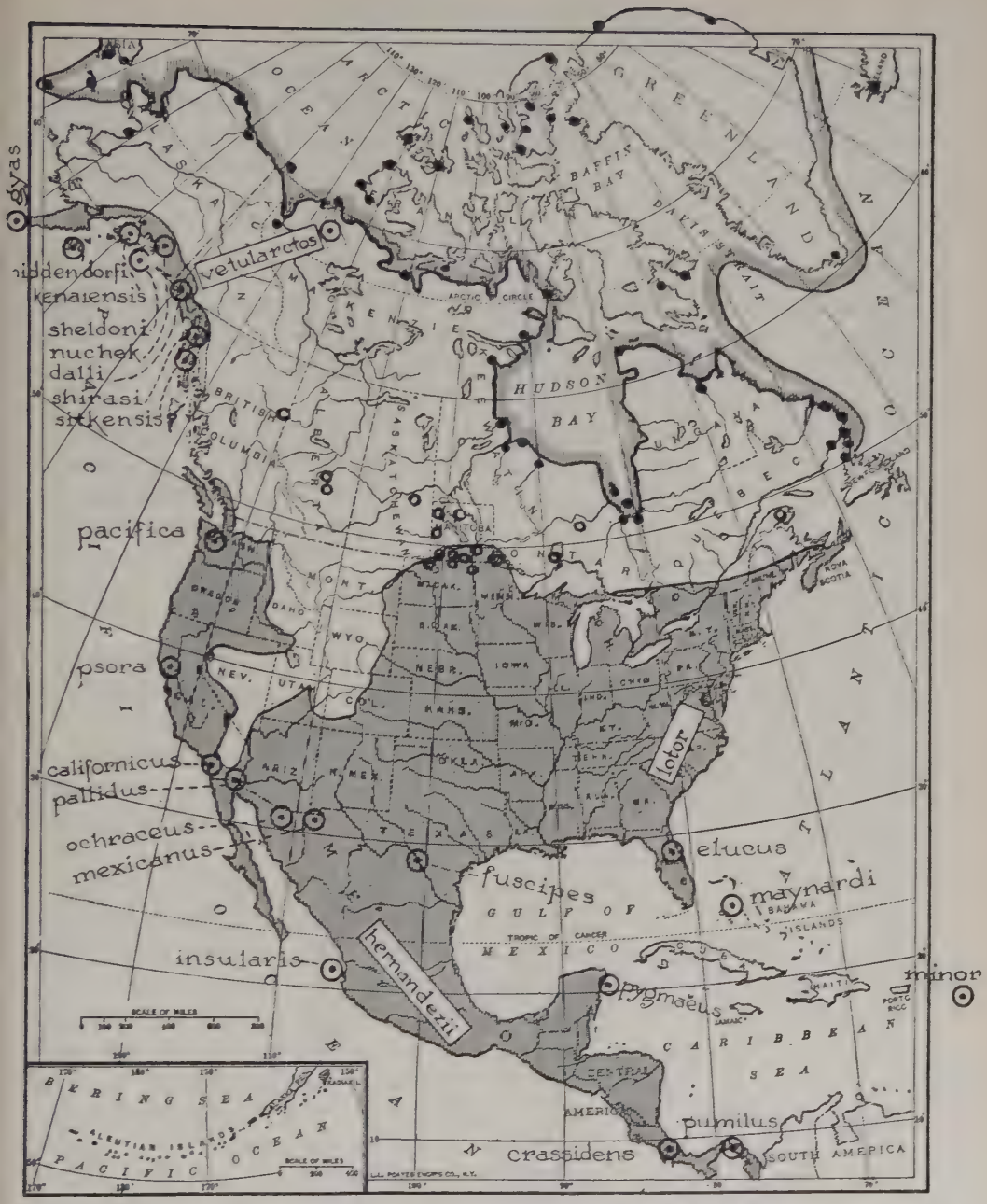
[6] Wild Nor. Pac., p. 230.

[7] Field & Stream, Aug., 1916, p. 505.

[8] Field & Stream, Aug., 1916.

[9] Wild. Nor. Pac., p. 231.

[10] Forest & Stream, March, 1922, p. 107.



MAP II.—RANGES OF ALASKA BROWN-BEARS, MACFARLANE'S BEAR (VETULARCTOS), POLAR BEAR, AND RACCOONS

By E. T. Seton, with assistance of the Biological Survey

Range of Polar Bear: Actual records are spotted on the map.
Range of Raccoons: The northern records are marked ○ to distinguish from Polar Bear records.

years, owing to decrease of Alaska's population. But, in spite of the temporary respite, there can be little doubt that in 10 years more, some forms will be extinct, and the remainder will be rare and driven to inaccessible parts.

Food

These are the foods he revels in—if indeed it be not absurd to list the things eaten by one who eats all things: In early spring Sheldon says their chief staple food is grass. They go marching along, cropping it like Cows, or big lonesome red Sheep. Their favourite is a red-tipped grass that occurs only in certain parts of the basins above timberline, and grows most profusely in patches of ground favourably exposed to the sun, so the snow melts early there. If the Bear finds an area well supplied with it, he remains there for some time—three or more weeks, if the basin is well stocked with it; but if the supply is limited, the Bear, after cleaning it out, will go to the next basin. Other grasses, growing both above and below timber, are much more abundant, but the Bears do not touch them. At the same time they dig out and eat Field-mice.

Soon they resume the far-ranging habit of their summer life; for the last week in May the Bears begin to travel widely, seeking more varied food. Along the beaches they pick up dead fish, crustaceans, or seaweed, and if a dead Whale or Seal be cast on the shore, it is a windfall that they frequent till it is wholly consumed. But ever they are ready to vary this strong, coarse fare with grass and roots and the fragrant salmonberries ripening apace.

The Grizzly digs out many Marmots in the country farther south, but Sheldon says: "I could find no evidence of Bears attempting to dig out Marmots which have their burrows among the rocks. Mice are exceedingly plentiful above timber as well as below, and the Bear always finds them at hand to supplement its vegetable diet. It determines the underground position of a Mouse by scent, and digs, sometimes furrowing the earth along the Mouse's burrow, until the Mouse is exposed, when the Bear places its paw over it, and, after biting it in the head, swallows it whole without chewing it. It requires from 5 to 10 minutes to dig out a Mouse, and a large proportion of those which the Bear attempts to capture, evidently running off before the Bear can place its paw over them, escape. The contents of the Bear's stomachs examined indicated that the number of Mice devoured in a day seldom exceeds 15, and often less."[11]

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[11] Wild, Nor, Pac., pp. 228–29.

"During this time, the Bears also have a supplementary vegetable diet, consisting of the roots of the skunk cabbage (*Lysichiton*) and berries when they can get them. I did not see any signs of Bears digging the roots of skunk cabbage in May."[12]

In June begins the big feast of the Brown-bear's life. Now the salmon commence to run, and the Bears gather and gorge themselves where the flooded streams are swarming with fish that are mad to spawn; and they stay till the latest run is over—which means all summer, for salmon of one kind and another are running till October.

Those who have seen this mighty brute a-fishing have given us a joyful picture. On a log, or overhanging rock, or even ankle deep on a sandbar, he stands; and those who think great bodies always move slowly, will be amazed at the lightning-quick sweep of the huge paws—each followed by a splash and the silvery twisting of a splendid salmon, flung high in air, to land and leap great lusty flashing leaps on the bank, till mighty *Gyas* has enough for another round of feasting.

These are, indeed, the mainstay of the Big Brownies. Are they not Fish-bears? But still they manage to balance their rations with grass, berries, and roots. The Bear's whole make-up smells of fish at this time—yes, and for long after. Not even the long bleaching-out of the winter's sleep entirely removes the smell. After the running salmon disappear, the Bears clean up the dead, decaying fish, and only when these are entirely gone do the big brutes repair once more to the sunny slopes above timber, to feed on grasses and Mice, until the time for hibernating comes again.

"Up to that time [Oct. 2]," says Sheldon, "fresh Bear dung was everywhere near the creek. It had contained huckleberries, skunk cabbage root, and salmon, including the bones. The Black bears on Vancouver Island do not eat the salmon bone. I had also seen old dung containing Deer's hair, but believe that it did not signify that the Bears hunted Deer. Deer are constantly wounded around the shores of Pybus Bay, and Bears must find the carcasses of those that die. I obtained credible information from a prospector that he had earlier in the summer seen a Deer and two Bears feeding on the top of a mountain within fifty feet of each other, and the Deer was indifferent. Nearly all the fresh dung that I had seen contained tapeworm still alive. That day, for the first time, I saw some fresh dung composed only of grass."[13]

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[12] Wild. Nor. Pac., pp. 230.

[13] As above, p. 202.

Mating

Analogy and native testimony agree that July is the mating season of the Big Brown-bears. Each male appropriates—which often means by force of arms—some acceptable female, and they roam the hills in a fast-and-loose sort of life and compact. Maybe one moon it lasts; but of that there is as yet no final proof.

If the male adheres loyally to one partner, it is probably due to the lack of temptation; which lists his fidelity in the lowest class of virtue. That is, the Bear is of the kind that keep straight because they have no chance to go astray.

It is tolerably certain that all the females cease to be mateworthy and interesting about the same time. The urge dies out in both the partners when the Love Moon wanes; and it is nearly sure that then they go each their own way, and if they meet by chance soon after, they pass like strangers. Lucky, indeed, is she if he give her not a vigorous paw-swat as she dodges out of his way.

Of course, those females that have young are not in the marriage mart this year. Young ones every other year seems to be the rule; or possibly even every third year.

Whether the male recognizes the cubs as obstacles to his joy, or has only the general sense of hostility that seems native to step-parents, his behaviour toward them reflects little credit on his kind.

The subject of the following story may have been a criminal Bear, but I suspect that there are many more like him in this realm of "Might-is-right."

L. L. Bales was hunting on Alaska Peninsula, Oct. 19, 1912, when he came on the fresh track of a very large Bear—a 1,000-pounder, it looked to him—and he followed it with a hunter's caution.

"Two hundred yards ahead were two more tracks," says he, "this time an old she-Bear and a year-and-a-half-old cub. And now it was a confusion of tracks, and the snow told the story of a desperate encounter among the plantipedes. The Big Bear tried to kill the cub. The mother Bear had made a brave defence, as the blood on the snow bore much witness, and the left hind foot of the cub had been lacerated in the mêlée, as blood from that foot plainly showed in the snow—but the cub finally escaped."

Later on, Bales followed up and killed all three Bears, to learn that the story of the fight, as told by the snow, was unfortunately true.[14]

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[14] Outdoor Life, July, 1913, pp. 21–24.

Young

The cubs are born in the winter den of the mother, as with most Bears, and arrive usually during January or sometimes in early February.

They are very small, considering the size of the mother, weighing about 1½ pounds, that is about the size of a Gray-squirrel. They number from 1 to 4; 2 being usual, and 4 very rare indeed. They are, of course, blind, naked, and helpless. Their eyes do not open until they are about 6 weeks old, i. e., judging from analogy of the Blackbears.

The number of mothers seen with but 1 cub attests the high rate of infant mortality among these Teddy Bears.

A remarkable instance is recorded by Harold McCracken, who went hunting Big Bears on Alaska Peninsula, Nov. 1, 1916, and on one day secured a mother with her 3 yearling cubs, each cub "as big as a full-grown Southern Brown Bear." They were probably not only yearlings, but well on in their second year; that is, they were 20 months old.

Which implies that the mother breeds only every third year, unless she has the misfortune to lose her cubs. If, however, all goes well, they come out into the big world with mother in the month of May. They continue under her care all summer and autumn. Then when winter comes on, mother selects a good den, perhaps goes back to the old one, if it was very attractive—but no one is positive about that. Here the whole family, less the father, curl up fat and happy, and sleep till the next song time comes, with the snow rug on the hills burnt by the sun into a million blackened holes.

These cubs are expert tree climbers, but the old ones, like the Grizzlies, never attempt to climb. Otherwise the cubs live the same lives as the parents.

The second summer, also, is passed together, and whether they all winter in one den again, is unknown. But it seems sure that in that third spring, mother encourages her big boys to get up and go seek their own fortunes. She has plans of her own, plans in which they would be a drag, for nothing less is the vague semiconsciousness of her big slow brain than the taking of another mate.

The youngsters, meanwhile, are on their own, but not disposed to go it quite alone; whether twins or triplets, they continue together in good fellowship until their brother bond is broken, probably by the same irresistible compulsion that forces the salmon up the stream to certain death, and the Wolf into what he knows is a fatal trap—the reproduction craze.

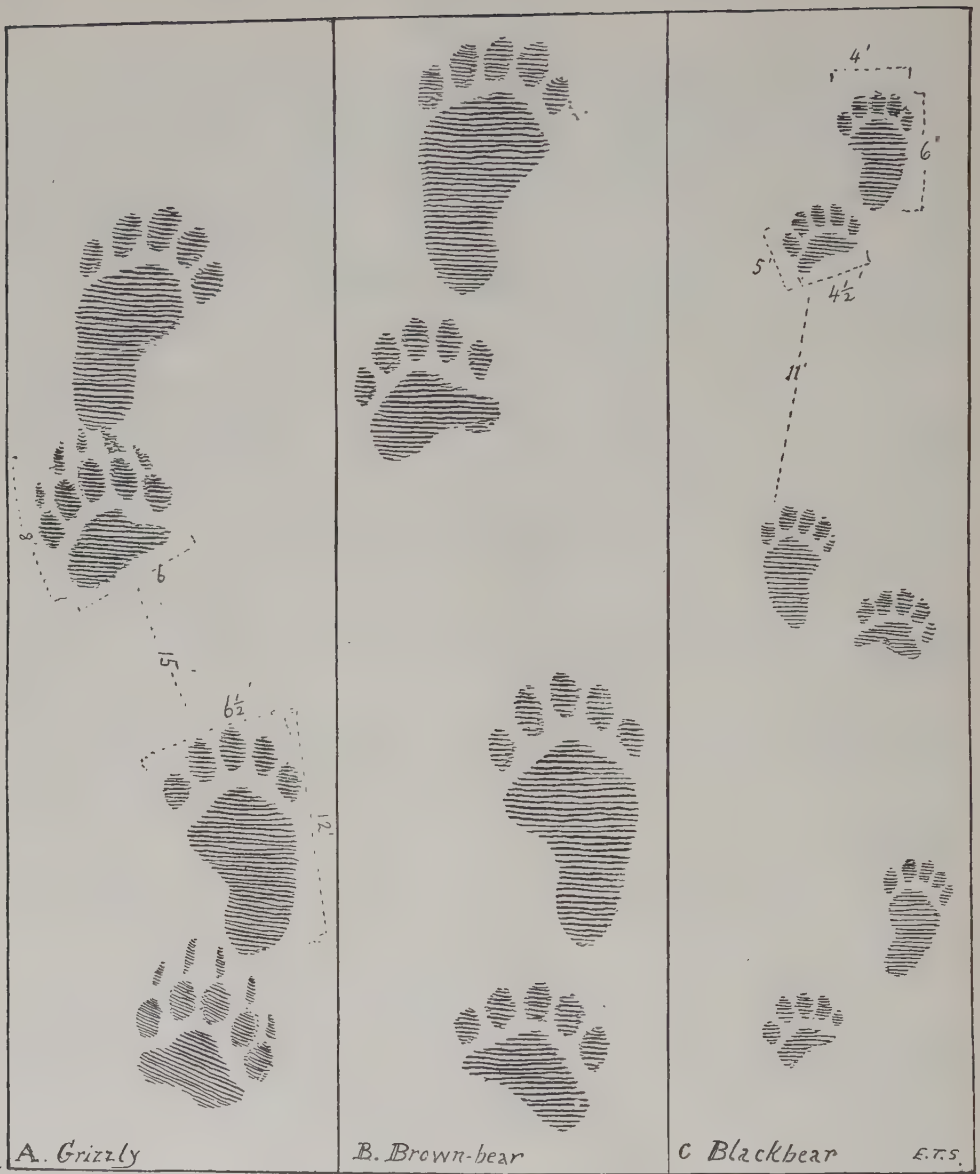

Plate XIII. Tracks: A, Grizzly. Yellowstone Park, Sep. 7. 1912. B, Kadiak Brown-bear. Washington Zoo. C, Blackbear. Athabaska River, Sep. 30. 1907 The chief differences are in size; also the Grizzly often shows claws.

They are mature at about the 7th year, and, judging from the lives of captives, seldom live beyond 25.

In Washington Zoo is a male Kidder Bear from Alaska. He arrived Oct. 7, 1907, and is now (1925) in full vigour and prime condition.

In the same Zoo is a Dall's Bear, female, that was 6 months old when she came on the 12th of July, 1900. She is obviously old, but quite vigorous.

His Way of Life

Spring dawns late on bleak Alaska. March is a month of deep snow; and on the uplands, April is a moon of unbroken whiteness. But the spring message is on the air; and the Bears come forth from their winter sleep when the April sun is strong.

Usually the males appear in early April. The females leave their dens about the first of May, or earlier if the weather be really warm.

All those whose place of hibernation was the western slope now perform a sort of local migration. They leave their own range, for it is still deep in snow, climbing the watershed to roam on the eastern slopes whose snowfall is light and rapidly disappearing. Thus, the Bear population is much concentrated at this season.

Early April sees the lone male out and astir. It is almost certain that his first fixed and religious act is to hie him to the nearest drink and fill himself with abundance of cold water that will go sluicing through his whole arterial venous and sewage systems—sluicing, purging, washing all toxins, lodged crystals, accumulated body-ash, and garbage matter clean away. So that with steam and gas pipes open and clear, his life-force renews its vigour with a wondrous silent whirr of all his parts so long asleep. Kidneys, bowels, liver—all respond; and hunger, the inevitable first-born of good health, demands attention.

For the first three weeks after hibernation, the Bear does not feed very much, and his entrails are much contracted. He eats sparingly, nipping the tender tops of green grass, and skunk cabbage if it be at hand. Then, as his machinery speeds up, he wanders to the seashore where good old Mother Sea has spread a bounteous feast of kelp—toothsome, fragrant, nourishing, and at the same time a needed and potent purge.

Robert H. Rockwell, who collected a number of the Big Bears for Brooklyn Museum, writes of two which he killed on Pavlov Bay, Alaska, May 13, 1921. On dissecting these animals, little or nothing was found in their stomachs except some kelp. In other specimens taken later, he found that grass had been their diet, and remarks with surprise on the

phrase "hungry as a Bear," for these though empty, were making no effort to find food.[15]

These evidently had not yet had their spring cleaning, and the tonics that are the routine of their newly awakened kind. Yet note they were fat—still very fat. Their bodies were swathed as in an inner robe of heat and health-giving fat that was 2½ inches thick in places.

Soon after this general cleaning-out, that is by May, the Big Bear is back in active life. The fat he carried all winter is slowly used up, for food is not yet abundant, nor as varied as it will be. But he knows the range, and devotes his vast energies to the task of feeding, with an energy and assiduity that amount to nearly 24 hours work per day.

Solitary and Diurnal

Outside of those definite family associations of mother and young, or of mates, or brotherhoods among cubs, the Big Bear is a solitary animal. No one has as yet recorded a "flock of Bears" or even a fellowship of two big full-grown Bears—males or females.

In that far land where there is no night in summer, there are obviously no truly nocturnal animals. It is not surprising, then, to learn that the Big Bear is diurnal. Tireless though he be, and much though his storage batteries may be filled up, by the 4-months winter nap, he still takes enough joy in life to relax at times. Sheldon implies, indeed, that three times a day, between meals, the giant reposes his mighty limbs.

"During the month of May," says this hunter, "they are diurnal, resting between 9 at night and 6 in the morning, and between 9 or 10 in the morning and about 4 in the afternoon. They rest concealed, always at or above timber, and sometimes among alders or stunted spruces high in the mountain slopes."[16]

And it seems that they rest in the sun, when the weather is cold; in the thicket of alders when it is hot, and on a snowbank if the flies are troublesome.

His Mind

Until 50 years ago, the Giant Bear had nothing to fear from any creature on earth. He was monarch of the North. The Wolf and the Sea-bear paid him deference, and tribute, too, if it came in the form of carrion rights. Arrogance born of undisputed power might well have been engendered in this Big Brown King. But now he has contacted our race

[15] Forest & Stream, Feb., 1922, p. 82.

[16] Wild. Nor. Pac., p. 229.

Plate XIV. Alaska Brown-bears. Washington Zoo.

with its far-killing chemicals. He has learned the menace of the man smell. He has become shy as a Deer, and never seeks trouble with us if he can avoid it.

As Sheldon says of the Big Bear he found in Montague Island:

It "is excessively shy, and flees from the presence of man. . . .

"When shot at before suspecting the presence of an enemy, the Bear, whether hit or not, seldom detects the direction from which the shot has been fired. After a moment of confusion, while attempting to find the point of danger, the Bear begins to run, and often starts directly toward the hunter. This is particularly likely to be the case if the bullet whistles over the Bear, or strikes objects beyond it. It often does the same when hit. Most people have interpreted this as "charging," when really the Bear is only running away from what it believes to be the direction of danger.

"On receiving a wound, a Bear's first instinct is to run into timber, for the purpose of concealment, but after travelling for a short distance through the woods, it starts up a mountain to reach some high spot, as inaccessible as possible, where it feels secure from the danger. If not wounded badly, it often travels over two or three mountains before resting."[17]

The Terrible Giant

"Never rob a boy of his heroes," said a professor of boy-culture the other day. "What! not even if they are false and misleading myths?" "No," was the answer, "for no reason whatever is it warranted."

What are we to do then about the ancient glorious fable which portrays the Big Brownie as a monster of insatiable man-eating ferocity, developed in proportion to his mighty bulk and strength?

These things it is very safe to guarantee to the hunter of Brown-bears: You will have much hard tramping over snowfields, rugged mountainsides, trying swamps. You will suffer terribly from fatigue and flies.

You will surely see a Bear, if you have a good guide, and stick to the hunt. The Bear will surely seek safety in flight. If you wound him, he will dash furiously in some direction. If it is toward you, that is an accident; he didn't know where you were hidden.

If you happen on a mother Bear at short range, she may attack you. But at long range she will run, leading her cubs with her.

With modern high-power rifles, two cool men have any Bear at their mercy. There is little danger in these Bear hunts.

However, there are exceptions. Men have been killed by Brown-bears, apparently, without having offered any provocation.

[17] Wild. Nor. Pac., p. 231.

PLATE XV.—ONTARIO BLACKBEAR
From life study by E. T. Seton, 1885
Original owned by H. W. Mickle of Toronto, Canada

PLATE XVI.—BLACKBEARS, ETC.

1. Blackbear marking his height. Photo by H. A. Pooler. 2. Bear in Yellowstone Park. Photo by E. T. Seton. 3. Bluebear in Washington Zoo. 4. Bears in London Zoo. 5. In Winnipeg Zoo. 6. E. T. Seton feeding Blackbear in Yellowstone Park

Dan. J. Singer says: "Last fall, while in Alaska, I learned of two authentic cases where men had been mauled by Brown-bear. Neither of these men, it seems, was carrying a gun at the time. I will cite one case which was told to me by Duncan Little, who packed for me on my Sheep hunt, and found the man dead.

"Duncan Little and his partner, Jack Rolls, were running a line of traps about 30 miles from Kenai Lake. One day they happened on to a little cabin. They had no idea of its existence before. It seems that a man, King Thurman by name, had built this cabin, and located a rich gold claim near by, and was secretly living there and working his claim. He had evidently gone out a short distance from his cabin, presumably for water, when he was attacked by a Bear and terribly lacerated. He must have crawled back to his cabin, for they found Thurman dead and the following memorandum in his diary: 'Have been tore up by a Brown-bear. No show to get out. Good-bye.'

"At his side was a twenty-two revolver. He had evidently shot himself to end his misery."[18]

In the *Journal of Mammology*, Aug., 1922, pp. 185-6, is set forth an "Instance of Unprovoked Attack by a Brown Bear."

"On August 25, 1921," says the writer, A. C. Bonebrake, of Goldendale, Wash., "I killed a Moose, while hunting on the headwaters of Sidney Creek, a tributary of the Nisutlin River, in Yukon Territory, Canada."

Next day, returning for the meat, he found a Brown-bear and her cub in possession. She was attacked by his Dogs, and charged. In spite of a heart-wound from the hunter's rifle, she mauled him rather seriously before she died.

While this looks like an unprovoked attack, it is quite evident that the Bear thought she was defending both her cub and her property.

These cases, however, are rare exceptions, and ordinarily, the hunter, armed with a modern rifle and plenty of ammunition, has no more reason to fear a Brown-bear than he has an ox in the barnyard.

Nevertheless, there is one dangerous situation which has arisen many times, and that the hunter must keep in mind. It is outlined thus by L. L. Bales, the well-known Alaskan pioneer:

"The Alaskan Peninsula," he says, "is an ideal place to hunt Bear, there being no timber in my section, and very few patches of stunted alder brush, which is the only cover the Bears have, and of which they seldom take advantage, unless wounded. And he who would follow a wounded Bear into an alder patch, would not be a brave man, but a foolish one; for if they hear

[18] Field & Stream, Aug., 1916, p. 502.

you coming, they will lie still until you are within a few feet of them, when they will come with a rush that is irresistible. I have seen a wounded Bear strike with his forearm a tough black alder four inches through, and break it as smoothly as though it had been shot off."[19]

When one sees this mighty brute, this furry Elephant, marching like an unquestioned king in his bleak, fierce kingdom, it gives one a fearsome hint of those bygone days when first our race was nursed and builded up out of feebler stuff. It recalls those days of our palæolithic ancestors, when the huge Cave-bears, much the same as these, abounded; and the only weapons our people had were clubs or spears—when the Bear was king and man the underdog. The haunting fear of those awful days is gone, but has left its indelible imprint on our souls.

Something of this horror we find in the word "beast." Much of it we get in our terror of the moving shape at night, of the rustling leaf behind us in the gloom. But also among the memories inherited of those times, the joy we discover in the brightly blazing fire, instinct of those bygone days, when that fire meant safety and comfort.

The giant has become inoffensive now. He is shy, indeed, and seeks only to be let mind his own business. At the slightest hint of man in his vicinity, he will fly fast and far, and covers many mountains to be sure that he has left that dreaded taint behind. It is modern guns that has made this change of heart. Man with a club is one thing—a joke, an easy meal maybe. But man with a modern rifle is a very different creature. Irresistible is he, implacable, sure death. The Bear's one safety is in flight; he knows it; he has learned the lesson; he takes no chances. He flies.

A land of great plenty is this Alaska of the Bears. Foods of a thousand kinds are lavishly strewn, to be had for the gathering. So that when November comes with chilly nights, with ice-bound brooks, with hillside spreads of food no longer available, the Big Bear is fat; and, knowing when to quit, he seeks him out a den. Sometimes, it is a natural cavern in the rocks; sometimes under an upturned root. Sometimes it is a den dug in a bank-side by himself. But, wherever it be, it is always well drained, high and dry; and yet sure to be deeply buried in warm protecting snow, when the arctic blizzards hit their hardest.

A warm season may delay the den-up till November; it is largely a question of food. There have been one or two cases recorded of big he-Bears that did not den at all, but prowled the stormy shores the winter through. For the cold alone is nothing. Granting a sufficiency of food,

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[19] Field & Stream, Aug., 1916, p. 504.

he can blink his small eyes and square his great stern in total indifference, or even scorn, to the bleakest blizzard wind that ever blew.

References for Giant Brown-bear

1912—Wilderness of the North Pacific Coast Islands, by Charles Sheldon.
1916—Giant Bears of the North, by Dan J. Singer, *Field & Stream.* Aug., pp. 499-505.
1918—Wild Animals of North America, by E. W. Nelson.
1918—Review of the Grizzly and Big Brown Bears of North America, by C. Hart Merriam, N.A.F., 41.

LIFE XIX—MACFARLANE'S BEAR

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MacFarlane's Bear, Patriarchal Bear, Yellow Bear, Woolly Bear

Ursus inopinatus (Merriam)

(L. *inopinatus*, unexpected)

Vetularctos inopinatus Merriam, 1918, N.A.F., 41, p. 132.
Ursus inopinatus (Merriam), 1924, Miller's N.A. Recent Mamm., p. 106.

Type Locality—Rendezvous Lake, northeast of Fort Anderson, Mackenzie, Canada

Merriam, who described this species, founded for it a new genus, *Vetularctos* Merriam, of which this is the type and only known member. It has a skull like that of *Ursus*. The teeth are, in the main, like those of *Ursus*, "but M_2 quite different, presenting a broad, flat, squarish, grinding surface, with suppression of the hypoconid and entoconid, and absence of the usual posterior cusp and notch on outer side." For a full technical description, the scientist is referred to Merriam's paper, as above.

In many of these tooth characters *Vetularctos* resembles the extinct giant Bears *Arctotherium* and *Tremarctos*, though the three genera have little else in common. "Nevertheless the resemblances are sufficient to suggest that *Vetularctos* may claim a rather ancient line of descent, from which *Arctotherium* and *Tremarctos* also arose—a line quite different from the one culminating in Ursus proper."[1]

Measurements. There are no available measurements of the solitary specimen on which this genus and species were founded.

The extraordinary character of the second lower molar is the outstanding feature; quite unique among living Bears, and harking back, apparently, to the days before the Brown-bears and Grizzlies had been evolved.

Colour. "General colour varying from whitish buff to pale yellowish buff (yellowest on back of head and neck), darkening to dull reddish brown on ankles, feet, and median line of belly. The pale body colour covers the entire body from between eyes to base of tail, and reaches down over thighs and upper part of legs. Muzzle, golden brown, becoming dull fulvous-brown around eyes; top of head from between eyes posteriorly

[1]Merriam as above.

soiled buff; long hairs of cheeks washed with buffy; ears pale buffy. Fur everywhere full, soft, and woolly; basal fur of upper parts varying from grayish to grayish brown, but distal half or more than half, pale buffy, so the animal as a whole appears to be buffy whitish."[2]

History

The history of this surprising hang-over from a far-gone geological day is as follows:

In 1861, Roderick R. MacFarlane, the famous old naturalist and fur-trader in the employ of the Hudson's Bay Company, set out to open up new possibilities for trade in the North, and built Fort Anderson on the Anderson River which runs into the Arctic Ocean about 150 miles east of the mouth of the Mackenzie. Here, as usual, he continued to collect natural history specimens, sending them to the Smithsonian and other Museums. In his own notes of those days published in "Through the Mackenzie Basin," Toronto, 1908, pp. 217-18, he gives the following account of a Bear hunt that provided a Museum specimen of unusual interest: "In the end of June, 1864, two Eskimo hunters observed a Brown-bear at some distance, and being, for them, well-armed, they went forward to meet it, and did their best to annoy it by uttering very loud and shrill cries. They made a stop, however, at a driftwood stand, shortly before constructed by them for the purpose of shooting therefrom at passing ducks, geese, and swans, and there prepared for action. One of them carried a Hudson's Bay single-barrelled flint-lock gun, and the other had a spear formed by firmly attaching a long knife of Eskimo make to the end of a somewhat slender pole about 6 ft. in length. When the Bear had closely approached them, it was shot and severely wounded, which, of course, made it perfectly furious; and it came on so very quickly that there was no time to reload the gun; but just as it was about to spring at and close with the man who had fired the gun at it, the other man struck fiercely at it with his spear, and both soon dispatched it with their knives."

That Yellow Bear's skin and skull lay unnoticed for over 50 years in the tin tanks of the National Museum, labelled ♀ specimen No. 1979 of MacFarlane's collection and in the U. S. National Museum collection, skin No. 8706, skull No. 7149, June 24, 1864. Now at last, with skins and skulls enough to indicate more than 80 species or races of big Bear in North America, Dr. C. H. Merriam comes across this surprising specimen and

[2]Merriam, as above.

announces the find just two years before the death of the collector at the age of 87.

Who will shed further light on this strange survival? Is it possible that more of the kind still roam the vast northern Barrens of Canada? Or was it the last lone representative of its ancient race? It is within the bounds of possibility that other specimens are even now reposing unnoticed in big museums, mis-labelled, perhaps, as Yellow Grizzlies. However it is likely that this was, like MacFarlane himself, the last of a rugged and heroic wilderness race, and it survived providentially to fall into his hands and furnish him a monument in the records of the Bears of a bygone day.

The following significant paragraph was written by Caspar Whitney some thirty years ago. It may refer to the present species: "A Bear is found on the Anderson River, which is near the Rocky Mountains, that corresponds to this one [the Barren-ground Bear], and it is possible it may make out into the Barrens in the summer-time, but I doubt if it is more than a visitor, and am convinced its real home is much nearer the mountains. It is a peculiar-looking Bear, seeming a cross between the Grizzly and the Polar, and it has this peculiarity, that its hind claws are as big as its fore claws, while its head looks somewhat like that of an Eskimo Dog, very broad in the forehead, with square, long muzzle, and ears set on quite like the Dog's. It is very wide at the shoulders, and its robe in colour resembles the Grizzly."[3]

R. M. Anderson continues: "This Bear (*inopinatus*) is not extinct by any means, and as it inhabits no-man's land, the edge of which is seldom reached by the Indians who range less far every year, and south of the Eskimo country in a large part, it has a far better chance to survive than *richardsoni* or *macfarlani*."[4]

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[3] On Snow-shoes to the Barren Grounds, 1896, pp. 243–44.

[4] Personal letter, Sept. 27, 1925.

LIFE XX—THE BLACKBEAR

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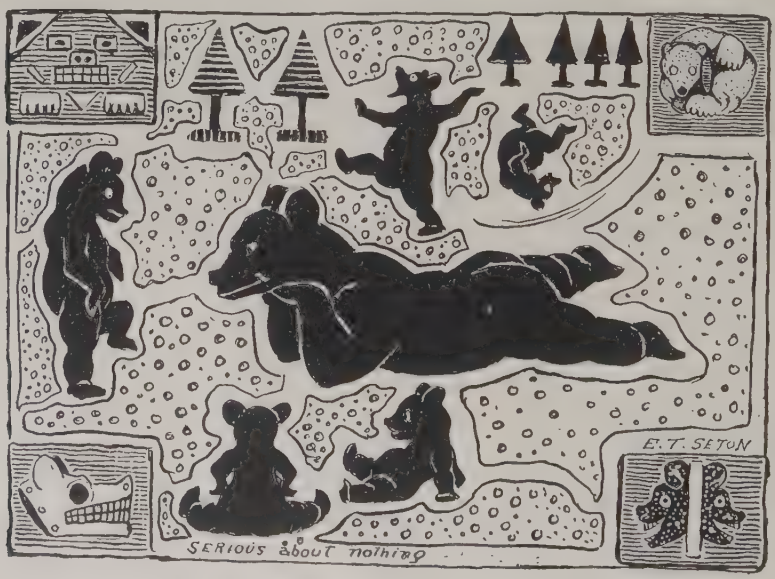

Common Blackbear, American Blackbear, Cinnamon Bear, Yellow Bear, Sun Bear, or Glacier Bear

Ursus americanus Pallas

(L. *Ursus*, a Bear; *L. americanus*, America)

Ursus americanus Pallas, 1780, Spicil. Zool. Fasc. XIV, p. 5.

Type Locality—Eastern North America.

French Canadian, *l'Ours noir, l'Ours d'Amerique.*
Cree, *Kus-kit-tay' Mus-kwa'* (Blackbear); *Sau-wis' Mus-kwa'* (Yellow or Brown-bear).
Sauteaux, *Mak-a-tay' Muk-wa'.*
Ojibway, *Mah-kay-tay' May-kwa'.*
Chipewyan, Sass.
Yankton Sioux, *Wah-conk-seach Sa'-pa.*
Ogallala Sioux, *Mah-to'-wah-hay See'-cha* (Blackbear); *Mah-to'-ho'-tah* (Brown-bear).
Mexican, *Oso.*
Apache, *Shaz.*
Chopunnish, Nez Percé, *Yackkah* (Lewis and Clark).
Crow, *Dah-pits-é.*

The Blackbear has the characteristics of the genus as set forth already, and is further distinguished by the short-curved claws on its front feet, and the nearly straight profile of the skull. Besides these, its peculiarities of dentition, size, and colour are very distinctive.

Size. A fair-sized and fat ♀, shot in Colorado, measured as follows: Snout to tail-tip, 63½ in. (1,613 mm.); tail, 5 in. (127 mm.); hind foot, 7¼ in. (184 mm.); height at shoulders, 25½ in. (648 mm.).

Audubon and Bachman give the following dimensions of a very large specimen:

From nose to root of tail, 6 ft. 5 in. (1,957 mm.); height to top of shoulder, 3 ft. 1 in. (940 mm.).[1]

Weight. Two hundred lbs. may be considered a medium sized northern

[1] Q. N. A., III, p. 188.

Blackbear; 300 lbs. a large one. There is, however, great individual variation in the respect of weight.

The Colorado ♀, whose dimensions have been given, weighed 227½ lbs. A 358-lb. Blackbear was killed recently by T. A. Ireland, on the Knight Ranch near Farmington, Wash., on the Idaho border, according to August Wolf of Spokane, Wash.[2] Col. Theodore Roosevelt says: "I have a perfectly authentic record of one killed in Maine that weighed 397 lbs."[3]

In Florida, this animal attains much greater size. Charles B. Cory, late Curator of Zoology, Field Museum, told me that he killed a comparatively small Floridian ♀ that weighed 350 lbs; a ♂ 411 lbs.; and a large ♂, 512 lbs.

William H. Wright says: "The largest Blackbear that I ever actually weighed myself tipped the scales at 462 lbs."[4]

Pennsylvania has recently been the standard-bearer in matters of game preservation, and has found reward in the size as well as the number of her Blackbears. A 360-lb. Bear was shot by James Smith of Bruceton, Pa., in Clinton Co., in the autumn of 1923.

"Quite a number of large Bears weighing 300 to 450 lbs. were killed last year, but the majority of grown Blackbears killed do not weigh more than about 200 to 250 lbs. hog-dressed."[5]

John M. Phillips, of Pittsburgh, writes me, Jan. 3, 1921, that he "has a record of a Blackbear taken in Pennsylvania, that weighed 510 lbs., also of others nearly the same" weight.

"The record Blackbear for all time in Pennsylvania, so far as our records go, was killed on Dec. 4, 1923, about 2 miles from the home of Governor Pinchot near Milford, Pike Co., by Norman B. Coykendall of Milford, Pa. The actual weight of this Bear, as killed, was 633 lbs. The total length of the Bear was 9 ft., and from tip to tip of the ears, was 19 in. This unusual record was verified by one of our field officers."[6]

John M. Phillips adds: "Another Bear almost as large was killed in this same section later in the season."

The *New York Zoological Society Bulletin* for March, 1922, p. 32, records an Anticosti Blackbear that weighed 635 lbs. on arrival, and speedily put on some 50 lbs. additional. Concerning these Anticosti Bears, Martin Hunter, the H. B. Co. fur-trader, says: "Of Bears, there are on the island

[2] Field & Stream, Dec., 1909, p. 756.

[3] Wilderness Hunter, 1893, p. 264.

[4] The Black Bear, 1910, p. 65.

[5] Game Comm., as below.

[6] Biennial Report of Board of Game Commissioners of Pa., for 1922–24, pp. 27–28.

both Black and Brown; the latter are of immense size, and very savage. One skin I got, measured 7 ft. broad by 9 ft. long."[7]

A still heavier specimen is recorded from Louisiana by H. H. Kopman.[8] It weighed 671 lbs.

Dr. R. C. Baird (in the Outer's Book for Sept., 1912, p. 236) announces the taking of a 720-lb. Blackbear in the Keimeche Mts., Okla., Nov. 16, 1911, and refers, for details, to P. I. Dillingham of Smithville, Okla.

But the record for size in this species, is held by the 900-lb. Blackbear that M. E. Musgrave killed on the Moqui Reservation, Ariz., in Dec., 1921. Musgrave was a hunter in the service of the Biological Survey. Although Blackbears are considered harmless as a group, this monster developed a taste for cattle-killing, which resulted in sentence of death being pronounced, and the sentence was carried out by Musgrave as related.

Young. At birth, they weigh about half a pound; when they come forth from the den, about 5 lbs.; at a year, 60 to 100 lbs.

Colour. The typical Blackbear of Eastern America is deep glossy black everywhere, excepting the muzzle, which is more or less brown, and the white patch commonly seen on the breast.

It will be seen, however, that Blackbears may be red, white, blue, black, brown, yellow, silver, or gold. Nevertheless, no true Bear has been found whose coat was decorated with a pattern of spots or stripes, just as no true Cat has been found without such.

As one nears the Mississippi, various shades of cinnamon brown are found, and in the Rocky Mountains, the browns increase. M. P. Skinner assures me that in the Yellowstone Park, only half the Bears are black. The difference of colour, however, does not mean a difference of species; they are mere freaks or sports of the black race. A black Bear may have cinnamon young this year, and black the next, or even one of each kind in the same litter. So also a cinnamon mother may give birth to either black or cinnamon young.

This was very well known to the hunters one hundred years ago. Alexander Henry, writing his "Journal" on Dead River, which flows into the Red above Winnipeg, says:

"*August 11, 1808.* Late this evening, while the Indians were still drinking, there arrived a party of young men who had been hunting *en canot* up Dead River; they brought some fresh meat, including that of a large Blackbear, and her two cubs, one of which was brown, and the other perfectly black. Both were kept at the Fort for a long time and became

[7] Canadian Wilds, 1907, p. 132.

[8] Dept. Conservation Bull., 1921, No. 10, pp. 30–31.

perfectly tame."[9] In the 5 years, 1800 to 1805, Alexander Henry collected 941 Blackbear hides on the Upper Red River; of this number, 195 were brown or cinnamon, that is about 1 in 5.[10]

There can be no doubt that a Bear born cinnamon never afterwards becomes black; although such a transmutation is not unknown in our own species: many brunettes were blondes as children.

Albinos, etc. A different colour variety is the albino, or pure white freak. Alexander Henry thus records a case on the Red River:

"*October 13, 1800.* Two Indians were with him, Nanaundeyea and Grosse Loge; they had made no hunt as yet. One of them a few days ago saw a full-grown Bear as white as snow. His gun missed fire, and the Bear escaped. He assured me that it was not the Grizzly, but the common kind."[11]

A second albino or white freak was taken near the settlement of Hague in the Adirondacks, N. Y., where for some time it had been giving rise to legends of a "ghost Bear." The capture was reported in *Forest & Stream*, Mar. 7, 1914, p. 314.

Thus the albino is rare in this species, and, for obvious reasons, the melanism unknown.

Young. For description of young, see later section.

Races

The following forms have been recognized:

americanus Pallas, the typical form. T. l., Eastern North America.

amblyceps Baird, a brown race with hairs lighter tipped, and with "great comparative breadth of head." T. l., Ft. Webster, Gila River, Grant Co., N. M.

carlottae Osgood, a large race with skull longer than in *americanus*, and teeth larger and heavier, etc.; said to be glossy black. T. l., Massett, Graham Island, Queen Charlotte Islands, Canada.

eremicus Merriam, a brown-nosed, black-furred race with brown under-fur, slender muzzle, and naked nose-pad very long. T. l., Sierra Guadalupe, Coahuila, Mexico.

floridanus Merriam, very large and wholly black. T. l., Key Biscayne, Dade Co., Fla.

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[9] Journ. p. 449.

[10] As above, various pages.

[11] As above, p. 118.

luteolus Griffith, a very large form with large teeth. T. l., Louisiana.

altifrontalis Elliot, a black form with tan nose, short broad skull and "exceedingly high forehead." T. l., Lake Crescent, Clallum Co., Wash.

machetes Elliot, a cinnamon form, with long skull, broad frontals, zygomatic arches very wide. T. l., Casa Grande, Sierra Madre, Chihuahua, Mexico.

emmonsii Dall, a brown-nosed black Bear of small size, frosted or silver-tipped, with white on the neck and body. Known as the Blue Bear or Glacier Bear, more fully discussed later. T. l., St. Elias Alps, near Yakutat Bay, Alaska.

kermodei Hornaday, a pure white form, recently found in British Columbia. T. l., Gribble Island, B. C. It may prove a mere albino, but at present is entitled to recognition as a full species. It is treated, so far as the material makes possible, in the next Life.

The Cinnamon Bear, Yellow Bear, or Sun Bear

The Cinnamon Bear, so long considered a different species, is now known to be merely a colour phase, a blonde appearing in a black-haired family. For some strange reason, the Cinnamon is rarely seen east of the Mississippi or in eastern Canada; and yet, so far as known, there are no skull differences correlated with its untypical colour, even in the regions where the Cinnamon is the prevalent shade.

According to Hal G. Evarts: "The Blackbear predominates also in the Sierras of California, while in Montana, Colorado, Wyoming, and parts of Idaho the browns appear in almost equal proportion to the blacks. . . . I have seen not less than 20 she-Bears followed by twin cubs, one black and one brown, quite irrespective of the colouration of the mother. This was in the Yellowstone, and in the country to the east of the park. In that particular locality, it is the rule rather than the exception that twin cubs throw to two colours. The black seems to predominate in the Jackson Hole country immediately south of the park, a circumstance for which I cannot logically account. These browns range all the way from a deep rich chestnut shade to very light tans."[12]

A very pale variety of the Cinnamon Bear was occasionally seen. "This animal," according to Evarts, "inhabited the open badlands and

[12] Sat. Eve. Post, Mar. 22, 1924, p. 40.

foothill country of Wyoming and Montana, upon the advent of the first white settlers. The fur of these animals was of a very light golden-taffy colour that glistened in the sun and earned the name of Silk Bear or Sun Bear for its owner. Very few of them were killed by the whites, and as far as I know, there is not a pelt in existence to-day."

On Sept. 26, 1904, at Dauphin, Manitoba, I saw a mounted specimen of this Bear in the collection of H. C. Nead, the local taxidermist. It was taken in the neighbourhood, June 11, 1904. It was everywhere of a pale straw or golden colour, with chocolate-coloured face and legs; yet it was clearly of Blackbear species.

In the coast region of Alaska, where the Blue Bear is found, the cinnamon specimens are, according to Osgood, unknown.[13]

The Blue Bear, Silver Bear, Glacier Bear, Gray Bear, Emmon's Bear, or Silvertip Black

The earliest mention I find of this is by Charles Hallock, as follows: "Up on the ridges back of Mt. St. Elias, which constitute a favourite hunting ground for Goats, is found a Bear similar to the 'Roach-back' or 'Silvertip' of the Rockies, but of a beautiful bluish under-colour with the tips of the long hairs silvery white. The traders call it 'St. Elias Silver Bear."[14]

It was originally described by Dall, in 1895, as a separate species, *Ursus emmonsii.*

"When first discovered,' says Nelson, "the Glacier Bear was supposed to be a distinct and well-marked species. Recently, cubs representing the Glacier Bear and the typical Blackbear have been found in the same litter, thus proving it to be a mere colour phase of the Blackbear. Its colour varies exceedingly, from a light smoky, almost bluish gray to a dark iron-gray, becoming almost black."[15]

About 20 skins in all have reached the museums, and a fine male, the first ever seen in captivity, is now in the Washington Zoo.

Dr. W. H. Osgood contributes the following notes: "All the specimens thus far received are from a small part of the coast of Alaska extending approximately from Lynn Canal to Cape St. Elias.

'The fact that this is a region of great glaciers, caused the animal to be called the Glacier Bear, and from this the idea soon prevailed that it lived exclusively in and about the glaciers, and had otherwise remarkable habits. The same region is inhabited also by black and brown Bears, both

[13] Peculiar Bear, p. 3.

[14] Our New Alaska, 1894, p. 166.

[15] Wild Animals of North America, 1918, pp. 437, 440.

MAP III.—RANGE OF BLACKBEAR AND ITS KIN, 1922 (KERMODEI AND EMMONSII INCLUDED)

By E. T. Seton, with assistance of the Biological Survey

On the light gray, it has been exterminated.

of which, especially the former, are frequently found on or near the glaciers. In fact, from such evidence as can be obtained from the inhabitants of the region, both white and Indian, there is not the slightest foundation for the belief that the habits of the so-called Glacier Bear differ in any way from those of the ordinary Blackbear of the coast of Alaska.

"So far as can be judged by material now available, there is no proof that the Glacier Bear differs from the black in cranial characters, such fragmentary skulls as have been received being identical in every respect with those of Blackbears of the same region. That it has been thought to be smaller than the Blackbear, is explainable by the probability that a majority of the skins thus far received are those of females or young. Therefore, the only peculiarity of *Ursus emmonsii* is its gray colour, which it now appears is subject to marked variation. As a specific character, this peculiarity might sooner have been questioned if the animal were not a large game animal of much popular interest, and one of which it is impossible to obtain large series of specimens from single localities. Probably 500 Blackbears are killed on the coast of Alaska to one of the gray colour representing *Ursus emmonsii*.

"If occasional specimens showing divergence in colour are found among large series of a given species of small mammal, it is not unusual to regard them merely as examples of dichromatism. Especially is this the case if the species is one in which dichromatism is already known to occur. It is very significant in this connection, that the cinnamon phase so well known in other parts of the Blackbear's range is unknown on the coast of Alaska. That a gray phase may represent it there certainly is not impossible.

"Another interesting factor in the case is the White Bear of the coast of British Columbia, called *Ursus kermodei*, which some regard as an albinotic phase of *Ursus americanus*. Evidently there is an unusual instability in the colour of the small Bears of the American northwest coast. Doubtless extremely interesting results would be obtained if some of our zoological parks should be so fortunate as to obtain living examples of these Bears and to successfully breed them in captivity.[16]

Hide and Meat

According to Henry Poland:[17] "The best skins are purchased by army contractors for the bear-caps of the Grenadier regiments of the British Army. These, although of a good natural black, are dyed to make them uniform. Two caps are usually made out of one skin. . . . 8,960

[16] Peculiar Bear, pp. 2–3.

[17] Fur-bearing Animals, 1892, p. 168.

skins were sold by the Hudson's Bay Company in 1891, and 8,049 by the Alaska Commercial Company and other traders." That is, 17,009 skins in one year. Reference to statistics given by Poland, shows this year to have been below the average, which was about 20,000 per annum.

There is the widest range of opinion on the fitness of the Bear for human food, and circumstances seem to justify all extremes. If a young, but full-grown Bear, recently fattened on grains, roots, and berries, be quickly and mercifully killed, and the carcass properly cleaned, skinned, and prepared, the meat is excellent. Smoked Bear hams have long been ranked among the delicacies of a frontier life. But they must be selected, killed, dressed, cured, and smoked with skill and care, or they are worse than disappointing.

Track, Dung, and Sanitation

The Plate shows the tracks of Grizzly, Brown-bear, and Blackbear. There is little to distinguish them but size and probabilities. The Grizzly shows the claws more often than do the others.

There is no characteristic by which Blackbear dung and Grizzly dung may be discriminated with certainty. Usually, size gives a hint. The seeds of roots and berries, as well as the quantity, distinguish the dung of the Blackbear from that of the Cougar. The dung of the Grizzly more often contains hairs from its carrion food. But no one feature is to be wholly relied on.

The Blackbear in captivity evacuates about 5 times a day, and is careful to keep the sleeping den clear of the product, but does not bury the same.

Range and Home Range

The range of the species and its various races is set forth in the Map with fair accuracy. On the north and northwest, it was limited only by the limit of trees.

The individual Bear is a wide ranger. Mitigwab, Indian guide of Mattawa, tells me that he several times followed a big Bear on a round of 15 miles from its home. I find it the opinion of trappers in general, that adult Bears, when footloose, will range about this distance. A mother Bear, with very young cubs, is, of course, more of a stay-at-home.

Primitive Numbers

How are we to form any idea of the primitive and present Blackbear population? The material at hand is far from satisfactory, but such as it is, I give it.

Hearne says that Blackbears were "so numerous in the country between York Fort and Cumberland House that in [June] 1774, I saw 11 killed in the course of one day's journey."[18]

On the Lower Red River in the years 1801 to 1808, Alexander Henry in his Journal states that he collected 941 hides of this species.[19]

During the years 1805–07, more than 8,000 Bear skins were shipped from the Big Sandy and Guyandotte Rivers [Ohio].[20]

Thomas Meacham of the town of Hopkinton, St. Lawrence Co., N.Y., "died a few weeks ago," according to the St. Lawrence *Republican* of Jan., 1850. "He kept an exact account of the game killed by him which amounts to the following: Number of Wolves, 214; Panthers, 77; Bears, 219; Deer, 2,550."[21]

According to this same work, p. 176, Nathaniel Foster settled in Herkimer Co., N. Y., because of its abundant game. He is believed to have killed more game than any other man in the State, in the same period: "76 Deer in one season; 96 Bears in three seasons; 25 Wolves in one year."

Bill Long, "A famous Pennsylvania hunter, who, at the age of sixty, died in Hickory Kingdam, Clearfield Co., Pa., May, 1880, is credited by his biographer, Dr. W. J. McKnight, with having killed all told: Bears, 400 (7 in one day); Deer, 3,500 (in 1835 one white one); Panthers, 50; Wolves, 2,000; Elks, 125; Foxes, 400; Wildcats, 200; Catamounts, 500; Otters, 75."[22]

These figures are helpful in showing the relative abundance of the animals.

Henry Braithwaite, the veteran woodsman of New Brunswick, says: "I have caught a great many Bears; my partner and I, hunting together one season, caught 30."[23]

As many as 30 Bears, according to Merriam, have been killed in one year in Lewis Co., N. Y., about 300 square miles; and the inference is that this was unusually high—moreover, we know now that it was too much for their numbers to stand.

I reckon that an animal, breeding so slowly as the Bear, could not stand a greater drain by man than 10 per cent. per annum; therefore, Lewis County must have had a Bear population of considerably less than 300. Yet this was considered an abundance.

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[18] Journey, 1795, p. 370.

[19] Journ., various pages.

[20] Forest & Stream, April, 1921, p. 165.

[21] Trappers of New York (chiefly biographical), by J. R. Simms, 1850, p. 271.

[22] Forest & Stream, Jan. 10, 1914, p. 40.

[23] Forest & Stream, Jan., 1925, p. 51.

Throughout the last quarter of the nineteenth century, the Hudson's Bay Company exported about 9,000 Bear skins each year, and the other fur companies about the same, an aggregate of 18,000 Bear-skins. But we know that thousands are killed when the hides are not worth shipping, and half of those taken are used or misused by the natives; therefore 30,000 will more nearly represent the annual kill on an area of about 5,000,000 square miles. As during the time cited the supply has, apparently, not dwindled, it implies at least 300,000 Bears, one to every 16 square miles.

In the Yellowstone Park, with its 3,000 square miles, the Blackbears in 1925 were by M. P. Skinner estimated at 150, or 1 to 20 square miles.[24]

In Glacier National Park (1,400 square miles) the Black and Brown Bears in 1925 were estimated at 148, that is, 1 to 10 square miles.[25]

The 22 National Forests of Oregon and Washington, totalling 27,019,200 acres, or, in round numbers, 42,000 square miles, are credited with a Blackbear population of 15,000, to which Washington adds 12 Grizzlies. This is, roughly, 1 Blackbear to 3 square miles.[26]

If such rates as these prevail in the Parks (and without doubt they were far exceeded in some regions), it would give us a primitive Blackbear population of at least 500,000.

In August, 1875, when he floated down Peace River, Prof. John Macoun told me that in 17 days he saw not less than 1,000 Blackbears. They were gathered along the river bottom to feed on the abundant berries. A considerable proportion were, of course, brown. Bailey tells that in 2 years, about 1883, a hunter with one pack of bear-dogs killed 182 Bears within 10 miles of a ranch.[27]

The game reports for Pennsylvania show that at least 500 Bears are killed each year in the game country, which is about 10,000 square miles. But the kill is not exhausting the stock, which must be at least 2,000, or one to every 5 square miles.

Probably this is near primitive conditions. It is certainly less rather than more numerous when compared with those prevailing in Lewis and Clark's day. This also implies a Blackbear population in primitive times of at least 500,000.

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[24] Bears in Yellowstone, p. 4.

[25] W. H. Hutchings, Supt., letter, Apr. 8, 1925.

[26] John D. Guthrie, Forest & Stream, Aug., 1925, p. 496.

[27] See "Hog-killing Bears" in this Life.

Fluctuation of Numbers, and Migration

A study of the fur returns shows that in primitive times and places, the Bear population rises and falls as does that of most species.

The hunters generally agree that the Blackbear migrates. It is a common experience to find Blackbears suddenly numerous where a few months before they were rare, but what the nature and extent of this migration are, or whether regular in time or direction, I have not yet been able to determine.

Pennant says: "Multitudes then [in midwinter] migrate into the lower parts of Louisiana: they arrive very lean; but soon fatten with the vegetables of that milder climate."[28]

Similarly Richardson writes: "In very severe winters, great numbers of Bears have been observed to enter the United States from the northward. On these occasions, they were very lean and almost all males; the few females which accompanied them were not with young. The remark of the natives above mentioned, that the fat Bears alone hibernate, explains the cause of these migrations."[29]

Speaking of the Bear on Hoosic Mountain range in Massachusetts, Emmons, as noted later, says (1840): "It is not many years since great numbers appeared there at once."[30]

Bachman says: "In hard winters, the Blackbear is found to move southerly in considerable numbers, although not in company."[31]

Roderick MacFarlane calls my attention to this fluctuation of numbers, but cannot satisfy himself of the reason. He discusses epidemics and migration, then adds:

"There are other circumstances also, such as an unfavourable season for breeding, a scarcity of the required food, and the destruction by fire of extensive areas of forest, which would, of course, more or less affect the abundance of these and other species of animals in certain localities. A very lingering spring, for instance, would compel Bears to leave their winter 'washes' while snow was still on the ground, and thus enable the Indians to track and kill more than would otherwise be possible."[32]

"The Indians themselves cannot account satisfactorily for the recurring seasons of exceptional scarcity of Bears in certain regularly occupied

[28] "Arctic Zoology," 1784, I, p. 60.

[29] F. B. A., I, p. 16.

[30] Quads. Mass., p. 24.

[31] Q. N. A., III, p. 196

[32] Personal letter.

tracts. If the Bears perished by disease, or even starved to death—a very unusual occurrence—they think that they should sometimes come across their remains in their many hunting peregrinations, if only for the reason that relics of a badly wounded animal are almost invariably discovered sooner or later in the vicinity of the locality where it was shot. Migration, therefore, seems the most reasonable solution of the difficulty."[33]

Distribution and Numbers To-day

It will be a glad surprise to many readers when they learn that the Blackbear is still found on scattered areas throughout the whole region east of the Mississippi and of Lake Superior, except that in the following places, it is extinct: Connecticut, Rhode Island, Delaware, Ohio, Illinois, Indiana, Iowa, Nebraska, and Kansas.

The following extracts are fragments of the evidence that might be piled up to any extent:

Maine. According to *Forest & Stream*, July 25, 1914, p. 130, the official report of Bears killed in Maine for 1911, 1912, and 1913 was respectively 86, 182, 58.

Joseph K. Savage credits his old guide John with having trapped 300 or 400 Bears about Mt. Katahdin, Me.[34]

New Hampshire. "Rather common in the White Mountain region and the northern part of the State."[35]

Vermont. Not uncommon in the Green Mts. According to *Forest & Stream* (as above) those killed in 1911, 1912, 1913 were respectively 53, 72, and 78.

Massachusetts. According to C. E. Gordon, a Blackbear was shot near Williamsburg, Mass., in the eastern foothills of the Berkshires in the fall of 1907.[36] This article first appeared in *Science* for Nov., 1908.

W. W. Sargood, Game Warden of Massachusetts, writes of October Mountain, "Quite often Bears have been seen on the Mountain."[37]

Connecticut. Mrs. Charles B. Graves, of 43 Granite Street, New London, Conn., writes me that she and her daughter met a Blackbear about 8 or 9 A. M., on the road 7 miles north of New London. This was in June, 1913. Two days later, it was seen by Deacon Geer near the same place, and later by other persons. It was believed to be a truly wild Bear.

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[33] Through the Mackenzie Basin, 1908, pp. 222–23.

[34] Field & Stream, Nov., 1918, p. 532.

[35] C. F. Jackson, Journ. Mamm. Feb., 1922, p. 15.

[36] Forest & Stream, Feb. 20, 1909, p. 291.

[37] Forest & Stream, May 9, 1914, p. 614.

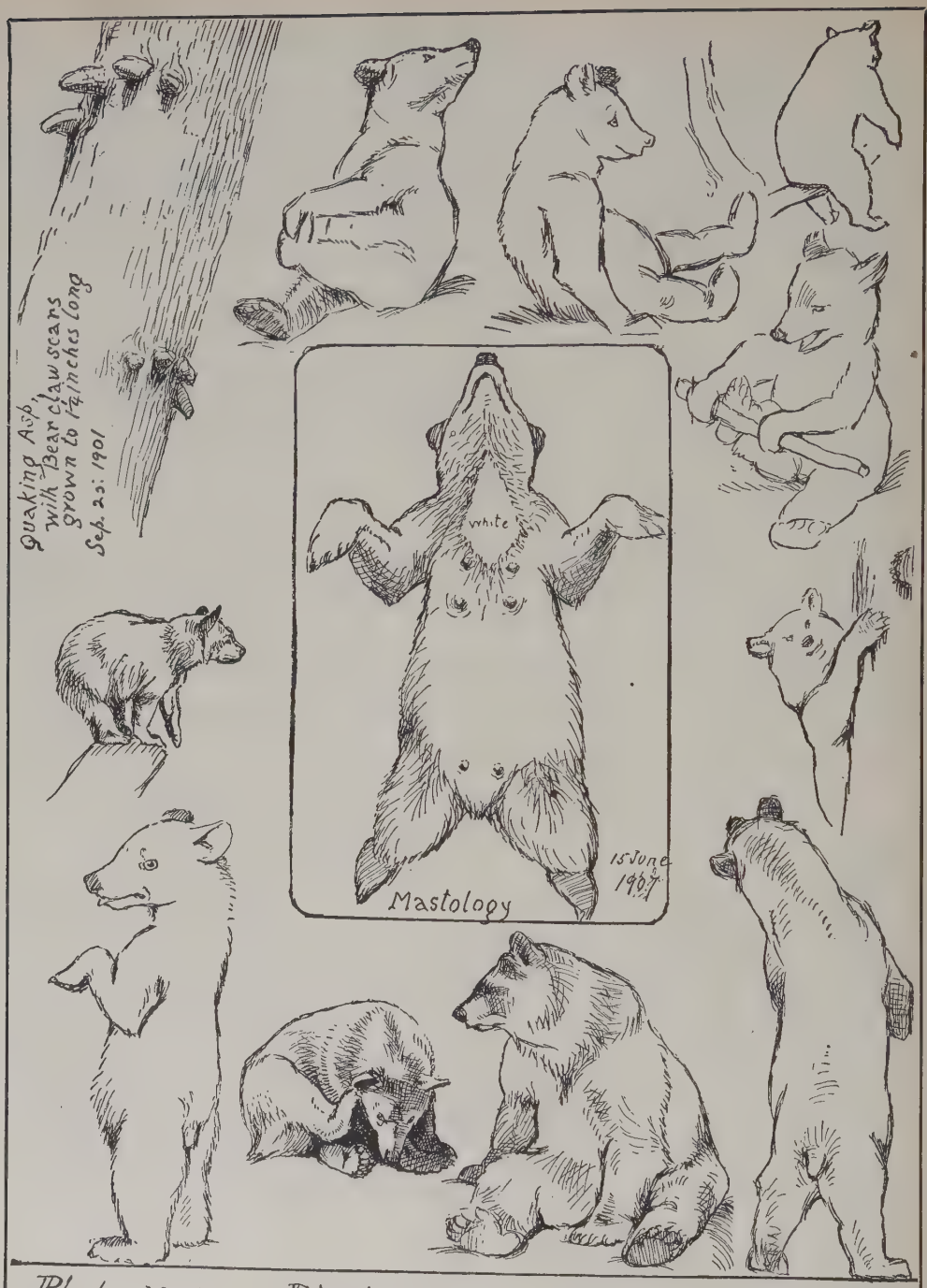

Plate. XVII. Blackbear-Mastology, Poses & Clawmarks.
from life by E. T. SETON

New York. "The returns made out for bounties, indicate that 52 Bears have been killed in Essex Co., N. Y., during the year 1906. In the town of Wilmington alone, one man, Asa Lawrence, killed 13 Bears, most of which, if not all, were killed before Oct. 1."[38]

Frederick K. Potter, writing Dec., 1923,[39] says: "It will be interesting to many lovers of the North Woods to know that Bears are still fairly plentiful in certain sections of the Adirondacks."

New Jersey. When at Lake Mashipakong, N. J., June 12, 1920, I talked with a number of local hunters, and was assured that Blackbear were still found in the wooded mountains around, but were rare.

In 1903, Rhoads says: "Once uniformly and abundantly represented in every county. . . . Now almost exterminated in New Jersey, but occasionally crossing the Delaware from Pennsylvania into Warren and Sussex counties. An occasional one is seen in the cedar swamps of southern New Jersey, but not oftener than once or twice in 10 years."[40]

Pennsylvania. Rhoads writes in 1903: "In the most densely populated counties of Pennsylvania, it is unknown; in about half of those remaining, it is found only as a straggler. In parts of the remaining counties, it is almost as numerous as ever known to have been. In other sections, where deforesting of coniferous woods has been succeeded by scrub oak, chestnut, beech, briars, vines, and berry-producing plants, it has increased in numbers, and may be said to be abundant."[41]

It is refreshing to note, that, according to the *Pennsylvania Sportsman*, Jan., 1916, Bear are still so abundant in Pennsylvania that a party of six in 1914 killed 14 Bear on one hunting trip.[42]

According to John M. Phillips and the published reports of the Game Commission of Pennsylvania for 1923, the Bears killed in the State for the 6 years 1918 to 1923 inclusive were respectively: 387, 472, 420, 510, 563, 500. Yet the report says: "Bears appear to be increasing rapidly."[43]

Maryland. A few are said to be found in the mountains of West Maryland.

Virginia. While staying at Hot Springs, Va., in the winter of 1920, I was told by local hunters that Bears were still found in the mountains

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[38] Geo. L. Brown, Forest & Stream, Dec. 29, 1906, p. 1027.

[39] Forest & Stream, p. 689.

[40] Mamm. Pa. & N. J., p. 183.

[41] Mamm. Pa. & N. J., p. 183.

[42] Ed. Cal. F. & G., July, 1916, p. 159.

[43] P. 27.

around. Still occur in Dismal Swamp. One taken in the spring of 1925, now in U. S. National Museum.

West Virginia. Bears are said to be rather common still.[44]

Kentucky. A few still found in the Alleghanies.

Tennessee. Still found in the Mountains of eastern Tenn.

North Carolina. In North Carolina, Frank W. Bicknell, writing from Linville Falls, N. C., Oct. 20, 1910, says that in that immediate region, Bears are yet common. A hunting party with Dogs killed 3 "last week." John Wiseman, a local hunter, had "killed 15 Bears about here."[45]

When I camped in the Blue Ridge of North Carolina in August, 1914, and April and May, 1920, the Blackbear was said to be found in all the surrounding mountains. Many old hunters gave me details of several Bears recently killed within a few miles.

South Carolina. Archibald Rutledge says the Bear is found in the Santee Swamp, or some of the more remote Delta Islands, and in the Big Wambraw.[46]

Georgia. "A Bear also occurs in the larger swamps of eastern Georgia."[47] Common in Okefinokee Swamp.[48]

Alabama. Howell says, "Bears doubtless ranged all of Alabama in early times, but at present are exterminated everywhere except in the swamps of the southern counties."[49] Reported in Yazoo County in 1894.[50] Several seen in the River at Natchez in April and May, 1912, during a big flood.

Florida. "The Florida Bear is still [1898] comparatively common in Florida, especially on the east coast. . . . There are also Bear, probably of this species, on Cumberland Island, where I am glad to say they are protected by the owners of the island.[51]

To-day (1925) in Florida, the Bear is still far from rare. Common at Lake Wimlico (1909).[52]

Ohio. According to Judge Emory D. Potter, "the Black and Brown Bear are still [Dec. 21, 1878] occasionally found in the northern tier of

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[44] For details see Brooks, W. Va. Board Agri., 1910 (1911), p. 27.

[45] Forest & Stream, Oct. 29, 1910, p. 393.

[46] Charleston News & Courier, Nov. 3, 1921.

[47] O. Bangs, Land Mamm. of Fla. & Ga., Proc. Boston Soc. Nat. Hist., March, 1898, p. 221.

[48] F. Harper, Abstr. Proc. Linn. Soc., N. Y., Nos. 24, 25, 1914, p. 35.

[49] A. H. Howell, Mamm. Ala., N. A. F., 45, 1921, p. 29.

[50] Forest & Stream, 1894, Vol. 42, p. 48.

[51] Bangs, as above.

[52] Fisher, Wilson Bull., XXII, p. 42, 1910.

counties of Ohio." (Mamm. Ohio, by A. W. Brayton, 1882, Geol. Surv. of Ohio, p. 185.) Since then, it has been wholly exterminated.

Michigan. The Black, formerly abundant throughout the State, is now confined to the Northern Peninsula and the northern half of the Southern Peninsula. In these areas it is generally distributed and not uncommon.

Wisconsin. Blackbears are, however, still common in northern Wisconsin. Jackson says: "Blackbears have reappeared in Oneida County since 1907, and are reported more plentiful in Vilas County. In late June, 1908, a female and 2 cubs were killed near Wolf Lake, Oneida Co., and there have been reports of others seen in the region nearby."[53]

Minnesota. "Restricted to the timbered areas of approximately the northern half of the State."[54] "Fairly common and, I believe increasing."[55] [Many details added.]

Missouri. Exterminated, except possibly a few in the big swamps of the Sunken Lands.[56]

Louisiana. Common in the big swamps in the northeastern part of the State, and in the coastal region.[57]

Texas. A few still remained (1909) in the Big Thicket region of Wharton, Braxoria, and Matagorda Counties; possibly a few in Orange County. Probably still occur in the Davis and Chisos Mountains of southwest Texas; elsewhere exterminated.[58]

North Dakota. Now very scarce; occasional in the Turtle Mountains or the Red River Valley.[59]

South Dakota. Practically exterminated.[60]

Oklahoma. Found only in the Wichita Mountains and not common.

In Canada. Formerly the Blackbear was abundant in every part of Canada where there was timber. It is now wholly exterminated in Prince Edward's Island, and the Southern Peninsula of Ontario, south of a line drawn from Georgian Bay and Lake Simcoe to Ottawa. In Anticosti, it is and always has been abundant.

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[53] Bull. Wis. Nat. Hist. Soc., VIII, 1910, p. 89; Cory, Mamm. Ill. & Wis., 1912, p. 398.

[54] Minn. Mamm., Johnson, Fins, Feathers, and Fur, No. 6, p. 7, Dec., 1916.

[55] C. E. Johnson, Journ. Mamm., Feb., 1922, p. 39.

[56] Schwartz, Bull. St. Louis Nat. Hist. Mus. Assn., Vol. 1, p. 42, 1920.

[57] Kopman, Bull. 10, Dept. Conservation, p. 30, 1921.

[58] Tucker, Forest & Stream, Vol. 72, p. 656, 1909.

[59] Bailey, Circ. No. 3, N. D. Agri. Exp. Sta., 1914, p. 18.

[60] Visher, Bull. No. 6, S. D. Geol. Surv., 1914, p. 91.

According to the Canadian Government Reports for 1919–20, 1920–21, 1921–22, the catch of Blackbear pelts in the Dominion was as follows: 7,588; 6,991; and 8,432. This does not include 993, 795, and 738 which are entered as Brown Bears; an average of 8,512 per annum.

In Western Newfoundland, the Blackbear is generally distributed but is not common; it never was abundant.

In July, 1913, Outram Bangs wrote: "The Blackbear is not uncommon on the island."[61]

In Northwestern America, the Blackbear is found wherever there is timber. This includes most of the large islands of the Northwest coast from Vancouver to Cook's Inlet.

Sociability, Voice, and Song

The Blackbear is essentially a solitary animal. Occasionally a number of them have been seen together, but these gatherings were either for the purpose of mating, or were a family of grown-up young ones with their mother. Nine out of ten adult Bears will be found leading solitary lives.

The Blackbear has a long list of vocal sounds to express his feelings to others of his kind. Besides the growl of anger and loud cough of menace, it has whining calls, and sniffs of many sorts, also a number of bawls expressing rage or pain.

The various sounds ascribed to the Grizzly Bear have, doubtless, their analogies in this species. Reference to the section on the ways of the trapper will shed light on its long cry that may be a call for help. Whether it has an assembly call like the Wolves is not known, and whether it has a love song is open to discussion.

However, I have several times seen a caged Blackbear sprawling out in some attitude indicative of ease, with one paw in his mouth, uttering a prolonged, whimpering, murmuring sound that certainly was an expression of contentment; and therefore, it must be classed as his song. So far as could be seen, this had no relation to sex or season.

Bear Trees or Measuring Trees

A more curious method of intercommunication is recorded in the following extract from Audubon and Bachman:

"At one season, the Bear may be seen examining the lower part of the trunk of a tree for several minutes with much attention, at the same time looking around and snuffing the air. It then rises on its hind legs, approaches the trunk, embraces it with the fore legs, and scratches the bark

[61]Bull. Mus. Comp. Zool., Cambridge, p. 510.

with its teeth and claws for several minutes in continuance. Its jaws clash against each other until a mass of foam runs down on both sides of the mouth. After this, it continues its rambles."[62]

In this connection, Merriam says: "In traversing unfrequented portions of the [Adirondack] wilderness, one occasionally meets with a tree whose bark has been scratched and torn at some little height from the ground, in a manner that cannot fail to excite his attention and surprise. This is the work of the Bear, but the object of it is not known. Hunters claim that whenever a Bear passes one of these trees, he stops, stands on his hind legs, and gnaws and scratches it before resuming his journey. The only account of the strange proceeding that I have seen is given by Audubon and Bachman."[63]

The fact is widely known among hunters, as the following extracts show:

"Why," says L. Allen, of East Wareham, Mass., "do Bears leave their teeth marks across a tree or a sapling, as high as they can reach, standing on hind legs? The highest marks are always freshest. Is it the same Bear that makes the higher mark, to see how much he has grown, or another Bear who can go him that much better?"[64]

"Bears bite trees all through the summer," says John B. Burnham. "I think they do that to see who is the tallest one. Only he-Bears bite trees. They bite them along their roads, and the one that makes the tallest marks, bosses the road. After you kill the big one, you don't see another he-Bear for a long time on that road. She-Bears pass any time."[65]

Other Bear trees are described in the "Biological Survey of Texas," by Vernon Bailey. Concerning one of these, he writes: "In the Davis Mountains, on the ridge just north of Livermore, a yellow pine a foot and a half through, has served as a bear register for apparently 10 or 20 years. It was deeply scored on all sides, from 4 to 6 feet from the ground, but on one side, from 5 to 6 feet up, the bark had long been cut away, and the dry weathered wood was splintered, and gashed with deep grooves of various ages. Two fresh sets of tooth prints showed on opposite sides of the tree near the top of the ring, and one little Bear had lately tried his teeth in the green bark about 4 feet from the ground."[66]

Finally, I can add my own testimony. I have seen many, yes hun-

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[62] Q. N. A., III, p. 189.

[63] Mamm. Adir., pp. 101–02.

[64] Recreation, Apr., 1900, p. 305.

[65] Forest & Stream, Mar. 18, 1899, p. 208.

[66] Texas, p. 188.

dreds, of these Bear trees, chiefly in the Rocky Mountains. They are always by some well-worn pathway or trail of the Bears, and are made and used by Bears of all species.

What is their meaning and purpose? It is very certain that such a remarkable and universal Bear habit must have some good object. I think there can be no doubt, as I have elsewhere, and years ago, said in print, that these are Bear "signboards," methods of communicating certain information to the Bears. They answer, I believe, the same purpose as the urinary signal posts of Dogs, Wolves, and Foxes.

A creature with such exquisite power of smell as a Bear has no difficulty in reading at once, by touch and taint on the register trunk, that here there has recently been a Bear of such sex and species, a personal friend or foe, as the case may be. The trail shows that he went in such a direction; by following the trail, one can overtake that Bear, or, if preferred, he can expend his sudden outburst of feeling on the offending but defenseless trunk.

These are fully discussed by M. P. Skinner in his "Bears in the Yellowstone," pp. 94–98. He agrees that they "possibly act to convey news from one Bear to another."

Some of our authorities who accept these as measuring trees, deny that they are in any sense the bearers of challenge marks. This seems merely a question of definition. If two men are enemies, and one come on a signboard put up by the other, the impulse to tear and treat contemptuously the mark of his enemy has in it the element of defiance. Whether or not, then, it be a challenge, depends on the personal relations. Sometimes the second Bear is utterly indifferent, and sometimes, as in the case described by Bachman, he vents his hate on the mark of his enemy.

William H. Wright does not accept this explanation, but has no other to offer. His views are set forth in the Grizzly Life.

The claw-marks made by a Grizzly differ from those of a Blackbear, first, in their size, and second, by being clearly 5 in number, while the latter often leave but 4. This is due to the shortness of the Blackbear's thumb and claw. In the Rockies, the aspen is most frequently used as a bear register, and it is singularly well adapted for records, as its smooth bark never loses its scars. The claw-marks of the Bear may grow out of pine or cottonwood, but once in the aspen bark, they stay there for life. Thus the bark of a growing aspen, carries a record of all that tree's vicissitudes, for those who can read. Bear claw-marks, frost-crack, woodpecker borings, insect ravages, horn thrusts from Wapiti, Squirrel gnawings, or the mere expansions and sutures of growth are all there, in plain and legible sight, as shown in Plate XVII.

Deep marks, such as claw-wounds, on the aspen, may even get stronger as years go by. I know of a singular case: a Blackbear climbed an aspen some 20 years before I saw it; there was the record plainly to be seen, but the claw-marks, at first deep pits, had filled up as level black scars, and at length became ever-lengthening bumps, till now, each was prolonged into black clawlike warts $1\frac{1}{4}$ inch long.

In addition to the claw- and teeth-marks, it is common to see the Bear tree more or less plastered with mud in which is hair. This was left by some Bear rubbing his back, and marking his height after he had been wallowing in the mud. Some observers think that the registers are used only in the running season, but I have reason to believe that, in a less degree, they serve the year round.

It is possible that the Bear's habit of adding his own record to a blazed tree may explain the following:

"The cardboard posters put up along the trails by the fire-rangers, are invariably riddled by the Bears, which have an aversion to such things."[67]

Bear Trails

All animals have a tendency to form beaten roads or trails in their home region—the trail to the water, that to a favourite feeding ground, etc. The heavier the animal, the more marked the trail becomes. The pathway of a Ground-squirrel through the prairie grass may be nearly invisible to us, but the pathways of Buffalo and Wapiti are open and well-worn highways that serve mankind, as they serve the beast that made them.

The present species is no exception to the rule. In all parts of the country where Bears are numerous, they have well-placed, well-worn pathways, which are adhered to by their race, with precision that justifies the pioneer Bears which first searched out and blazed them as the best and safest roads from this to that inviting land of promise.

There is abundance of testimony for this. L. Allen says: "I have noticed that Bears are methodical in their habits, always following their own trail until their tracks are deep depressions in the ground."[68]

After telling of a long hunt through the snow after three Bears, C. Wasgatt adds: "All this time, the Bears had walked in the track made by the leaders."[69]

In detailing the methods of a successful Bear trapper, J. B. Burnham says: "Bear-trails in places are well-defined paths. . . . In passing

[67] L. L. Snyder & J. L. Baillie on Mammals of Algonquin Park, Can. Field Nat., May, 1923, p. 94.

[68] Recreation, April, 1900, p. 305.

[69] Maine Sportsman, Oct., 1900, p. 12.

over these trails the Bears step in each other's footprints, and if one Bear 50 years ago crossed a log at a certain spot, every Bear that followed is morally certain to have chosen the same place. Moreover, they never deviate from the exact line of their trail, if it is in any way possible to avoid leaving it. Knowing these facts, Guy never baits his traps. In setting them, he has two considerations to keep in mind—first, placing the trap where a man will not set his foot in it, and, second, where a Bear will.

"On the Twin Pond runway, he found a spot where a small spruce tree had grown up directly in the Bear's path. A man would step to one side to pass this if he happened to be following the Bear's route, but the Bears themselves, on account of their conservatism, preferred to go under the low-reaching boughs."[70] Skinner writes me: "In one case, I know of a log across a Bear trail. Every Bear stooped and went under it at much inconvenience."

To this, I can add my own corroborative experience in the Rocky Mountains. Where the Bears abound, the whole region is laid out in trails that are the outcome of necessity in a rough country, and knowledge of the best sources of supplies. They differ from human trails only in that the Bear makes no effort to improve the road; it merely selects the best available. In this particular, many rodents are in advance of their betters.

In some regions where I have camped—the Bitterroots, for example—where the forests on the bottom-lands are particularly dense, and the Bear trails are exceedingly numerous, not only are they the best routes, they are the *only possible routes*. If you are in search of the things those Bears sought—berries, fish, water, or pleasant open hillsides, breeze-swept of flies—your part of wisdom is to follow the Bear trail. It was made during generations of search for these same joys of life, by those who were past-masters of the road, and had sought out all the most delectable spots in the hills.

The Bear trail differs from the Wapiti trail in several ways; first, it is deficient in head-room, unpleasantly low for a man; second, it always runs *along* a fallen trunk, if such be in the line; third, it crosses a stream by a log in preference to a ford.

It is well to remember further that, in a Bear trail, there is always danger of a Bear trap.

As a Tree-climber and Tumbler

Of course, it is well known that the Blackbear, unlike the Grizzly, is a good climber; but I shall never forget the surprise I got when first I saw a

[70] Forest & Stream, Jan. 7, 1899, p. 3.

PLATE XVIII.—ASPEN TREE WITH MARKS OF BLACKBEAR CLIMBING
Colorado, 1901

PLATE XIX.—ASPEN WITH GRIZZLY CLAW-MARKS
From photograph by Mrs. Grace G. Seton

PLATE XX.—BEAR'S SIGNPOST, MUCH MARKED
Wilson Flattops, Colorado, 1901

PLATE XXI.—ASPEN ONCE CLIMBED BY BLACKBEAR. EACH CLAW-MARK IS NOW A BUMP
Colorado, 1901

PLATE XXII. HOME LIFE OF A BEAR FAMILY

Plate XXIII. Blackbear - right side paws.
Hind is 8 inches long. — TORONTO, Jan. 1894.

wild one climb a tree. I had pictured to myself something like the slow moving up of a man or a Sloth, or at best, the action of an expert sailor going up the shrouds. But what I really saw, was more like the action of a Cat. It had not the spring and agility of a Squirrel or Marten, but this Bear went up twice as fast as any man could, and quite as well as any Monkey that ever I saw.

In coming down, he travels tail first, whereas the Coon and Squirrel come down head first.

The following note by R. N. Pemberton, gives fuller details of the Bear's behaviour aloft, and also shows how he gets a brief respite when overharassed by Dogs:

"The tree which the Dog was guarding so faithfully, was a large fir, and there was the Bear lying on his back across two limbs 80 feet from the ground. He was wagging his head from side to side and gasping for breath.

"It is an interesting sight to see a Bear climb one of these large trees. He does not climb straight up, but circles around the body of the tree with a series of leaps, ascending corkscrew fashion until he reaches a convenient limb.

"When he descends, he usually falls, landing upon his haunches and springing like a bounding ball out into the under-brush. Sometimes a Bear climbs a tree for a short distance, rests awhile, slides down and renews the chase. When he does this, the chase generally covers many miles.

"As the hunters assembled at the tree, it was found that the chase had lasted 45 minutes."[71]

It is quite a common thing for a Bear up a tree, when fired at, to throw himself to the ground from a considerable height. Those hunters who do not know this trick are apt to think the game is killed, and are generally surprised to see him bound off, as though quite unhurt.

A friend of mine had a Blackbear cub that used to play some very curious tricks on a Dog that he alternately played and quarrelled with. Hiding in a tree, under which the Dog sometimes slept, he would wait a good chance to leap from a height of 15 feet, and land with crushing force on his enemy's body, not breaking any bones, but knocking his breath out, and driving him away in ignominious rout.

A remarkable habit, akin to his tree-jumping trick, is seen in the following by Dr. Charles H. Townsend. Describing the flight of a wounded Blackbear in northern California, he says: "In following this Bear across the many steep-banked gulches that it had sought in its precipitate flight, we observed that it had descended all favourable declivities by rolling, head

[71] Field & Stream, July, 1917, p. 235.

over heels, to the bottom, apparently gaining time by headlong tumbles down hill. This, as I was afterwards told by Indians, is not an unusual trick with wounded or frightened Bears."[72]

In the Water and Afloat

Bears are good swimmers. It is quite a common thing to see Bears in Muskoka and in northern Manitoba, make voluntarily long swims across lakes and rivers. In the August of 1906, Dr. Gordon Bell, with the other Water Commissioners of Winnipeg, secured a large Bear swimming in Shoal Lake.

There is one amusing incident of a Bear in the water, that has happened many times. A hunter of limited experience sees a Bear swimming boldly across some lake, as is their habit when they wish to make the other shore. A boat is launched quickly, and the Bear is overtaken. But now the excited paddler realizes that he has forgotten his gun; the Bear turns, and, making for the boat, hooks both his fore paws on the gunwale, and the hunter, backing away, thinks only of balancing the boat so it will not upset.

The Bear scrambles in. Thanks to the desperate efforts of the hunter, the balance is maintained; but the two occupants are equally afraid of each other. They crouch as far apart as possible, one at each end. So they sit and glare.

But the friendly breeze is busy, the boat is drifted to some near shore where it grounds, and the Bear springs out. The hunter is glad to call the game off, and paddle home in defeat.

On some occasions, however, especially when the craft was a canoe, the Bear's notion of "trim" has proven so inadequate that both hunter and hunted have had to swim for it.

Another ancient version of this comical scene is the following. It appeared in *Forest & Stream* in an article by Henry Bannon, April, 1921, pp. 187, 188:

"George Cochran, who came to the Ohio valley in 1799, had a peculiar experience with a Blackbear. He saw a Bear swimming in the Little Scioto, and determined to give chase, though he had no rifle. He found a canoe tied to the bank, and started in the canoe after the Bear. Every time the Bear made for the shore, Cochran turned him with the canoe. This finally exasperated the Bear, so the next time the bow of the canoe was upon him, he turned and climbed into the canoe. As Cochran was rather careful of the company he kept, he jumped from the canoe and swam to shore. The

[72] Field Notes on Mammals, etc., of Northeastern California, Proc. U. S. Nat. Mus., 1887, p. 183.

last seen of the Bear, he was [in the canoe] licking his fur dry as the canoe slowly drifted down with the current."

Wallowing and Doping

Old hunters who have lived their lives among the one-time swarming Bears of the Rockies, tell you that a Bear is a kind of a Pig. What a Pig will eat, a Bear will eat; what a Pig will do, a Bear will do; only, a Bear is smarter, and he can climb. Many of them apply Pig nomenclature to Bears, speaking of them as "boars," "sows," "droves," etc., and their soiling pits as "wallows."

In the Colorado Mountains, I once saw a black muck wallow much like that of a Wapiti; but all about were evidences that a mother Blackbear and her young had been using it in Pig fashion. The hunters there said wallowing was a constant practice of Blackbears in hot weather when flies were troublesome, or when they were shedding their coats. This, however, was on September 21st.

Another kind of wallowing is indulged in by these Bears. I once called attention in *Recreation Magazine* to the trick of rolling in carrion, or doping, that is common to Dogs and Wolves. Among the comments called forth was the following:

"Having read in *Recreation* of Dogs rolling in carrion, and having seen them do it, I can add another animal to the list, which I have not seen mentioned, and that is a Blackbear. I have a cub about 4 months old, to whom I gave some cooked fish that had been left over from supper the night before. Instead of eating it, he took it out of the pan, and began to roll in it, rubbing his head and shoulder the same as I have seen Dogs do."[73]

"On July 23, 1924," writes M. P. Skinner, "an 18-months-old cub rubbed head, neck, and shoulders thoroughly in old, stale garbage remaining from the previous night. Canyon, Yellowstone Park."

Age, Disease, and Enemies

Referring to the Bears in the Zoo near Akron, Ohio, fully detailed later, Baker says:

"Both Bears of the original pair, now 24 years old, are still in excellent health, although the male does not become as fat in the autumn as he did when younger, and the female has had no cubs for the past 3 years."[74]

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[73] James W. Nicol, Moore, Wash., Recreation, March, 1900, p. 223.

[74] Further Notes, p. 4, 1912.

Among the 68 cubs born in the Akron Bear family, "no cubs have been lost except through accident, and the death of a Bear 20 months old was the only one from disease."[75]

In the wilderness, the mosquitoes plague the Bears, much as they do other large animals, To what extent they are pestered by ticks, bugs, flies, or lice, has not been recorded.

Besides man, there are at least three enemies that the Blackbear has learned to shun: the Cougar, the Grizzly, and the Porcupine.

In the Lives of these animals, are given accounts of Blackbears killed by each of these dangerous creatures.

Henry Bannon says: "As the Grizzlies vanish, the Blackbears appear, for the former are the inborn foes of the latter."[76]

Probably, we should add the Wolf to the list, for it must be a menace to the cubs. Their safety from such attack lies in the speed with which they can climb a tree, as much as in their mother's valour and devotion.

J. K. MacDonald, of the Hudson's Bay Company, told me that about 1880, when on the Sascateway River, Lake of the Woods region, he saw the body of a Blackbear that was killed by Porcupine quills. Its mouth and lips were full of them, and its head swollen to a frightful size, nearly two feet across. The unfortunate creature could neither open nor shut its mouth; it was found starved to death in a pool full of suckers which it could easily catch, but could not eat.

Many hunters have told me that the Panther is a desperate and dangerous enemy to the Blackbear. I cannot refer to any eyewitnessed account of one of these battles, but recollect that in my young days, many of the hunters talked of them as of regular occurrence, particularly in the mountains of Pennsylvania.

One hunter heard the long wailing and bawling of a Blackbear, and, crawling near, expected to see the creature in a trap. But, no! He had backed as far as possible into a slight hollow in a hillside, where, furthermore, his rear was protected by a tree, and was vigorously defending himself against the onset of two Panthers. The Bear was obviously at a great disadvantage, and, without doubt, the Panthers would have killed and devoured him; but the hunter interfered by shooting one of the assailants. Before he could reload, the other Panther and the Bear disappeared in the woods.

Why was the Bear bawling? Did he hope thereby to win help from some other of his kind, or was it the outcry of terror? More likely the latter,

[75] Further Notes, p. 3.

[76] Forest & Stream, Dec., 1921, p. 563.

PLATE XXIV.—PRINT OF BLACKBEAR'S LEFT FRONT PAW
Made by driving the Bear over fresh black paint then across strong paper. Secured by Mrs. Grace G. Seton

as there is no record of an adult Bear going out of his way to help another adult of his kind.

Intelligence

Among hunters, I find the greatest difference of opinion regarding the Bear's intelligence. Some will tell you that any one, with any kind of a trap, can catch a Bear. Others maintain that the smartest Fox that ever lived is a fool to an old Blackbear, and stoutly contend that a successful Bear hunter and trapper has attained the acme of woodcraft.

There are doubtless exceptional Bears, whose performances have raised the trappers' opinion of the whole race. It is well known, also, that each specialist is apt to give first place to his own craft, and ascribe to his prey an intelligence that he denies to creatures which he knows less about.

There is little doubt that the Bear is high in the scale of mentality, though it cannot compare with a Dog, Fox, or Wolf. It is gifted with marvellous powers of smell and hearing, and has a deep-rooted shyness about all things strange, or doubtful; which saves it again and again from traps of various kinds. Its fixed, safe, and saving motto is: "In case of doubt, *run*," and it is nearly always in doubt.

I have frequently seen a Bear at a distance of half a mile cease feeding, throw up his nose as the tell-tale wind brought tidings of my presence, then fly to the woods, to journey miles before again assured of peace.

On the other hand, the Blackbear's eyes are not very good, and twice on the open plains in Manitoba I have, at broad daylight, walked right into a Blackbear that did not know I was near, simply because I had the wind.[77]

The Elusive Blackbear

There can be little doubt that there are still a few hundred Blackbears in the Adirondacks, and yet thousands of visitors go there every summer and never see hair or sign of a Bear. Yes, more than that, the most experienced hunters are out every year—more often indeed than the law allows—and very rarely see a Bear. Yet we have abundant evidence that the Bears see them on countless occasions.

This is the explanation. The Bear is gifted with far better ears and nose than man has. As soon as he hears the sound of a human voice, a doubtful crack of a stick, at once he stands stock-still, till quite sure of the direction; then glides away like a black shadow, travelling much faster than any man could do, and keeping it up for miles, till far from that hateful sound and that meaningful smell, safe once more and freely breathing.

[77] See Analysis of Old Mose's Brain in the Grizzly Life.

Writing of "Bear-hunting Around Katahdin," Me., Joseph K. Savage quotes his old guide as follows: "'I've never shot a Bear in the open yet,' confided John to me in a whisper, 'although I've trapped 300 or 400 about here. This damn burn is too noisy to hunt in; they'll hear you half a mile away. The trouble is that the fire left most of the dead big timber standing; then as the new "green" came up the old trees fell over on the young ones, and bent them down, without killing them, and the whole mess grew criss-cross.'

"'Well,' I admitted, 'I have only seen one Bear in all my 15 seasons in the woods, and he was too quick for me.'"[78]

Frederick K. Potter writes: "For many years I have hunted and trapped through certain sections of the Adirondacks. Winter, summer, spring, and fall, I have been in the big woods, but in all my travels, I have never seen a Bear. True, I had frequently come across fresh signs, not more than an hour or so old, but luck had always favoured the Bear, and I had never seen one."[79]

Convincing proof of its alertness and shyness is seen in the well-known fact that practically all Bears observed by man, without the aid of Dogs, were met through the man sitting still at some good lookout, so the Bear unwittingly sneaked up on him. Almost never is the encounter the result of the man sneaking up on the Bear.

It is a moral certainty that no man ever camped for a month in the Rocky Mountains or other wilderness, without having been spied on by a Blackbear; and it is equally certain that not one man in a thousand who has camped in that wilderness, and who was unaided by Dogs, has had the luck to stumble on and see a Bear.

My old friend, Director N. Hollister of the Washington Zoo, told me that though he had hunted Bears in the Rockies from Arizona to Alberta, and in the canebrakes of Arkansas and Louisiana, during some 30 years, he had never once seen a living wild Bear.

The Ways of the Trapper

The abominable steel trap was at one time the chief reliance of the Bear hunter. It is a gigantic rat-trap with long, sharp teeth on its jaws. These seize and hold the Bear by the foot, until the hunter comes up and easily shoots the helpless captive. Fortunately, most States have forbidden the use of these traps as cruel, unnecessary, and liable to injure stock, as well as human beings.

[78] Field & Stream, Nov., 1918, p. 532.

[79] Forest & Stream, Dec., 1923, p. 689.

I would avoid giving any hints on the art of trapping, but find one or two Bear trapper narratives so full of valuable natural history that I quote from them rather fully.

A very complete account of Bear trapping in the Adirondacks is supplied by Frederick K. Potter. His time of operation was in the springtime when the snow lay deep and soft in the woods. His account is replete with good natural history observation. Incidentally and unwittingly, it is also a shocking exposé of the cruelty incidental to Bear trapping. He thus relates the capture and killing of the first Bear:

"As I neared my first trap in the hollow log, I thought I heard some animal bellowing—a long way off. Then, as I stood listening, wondering what it was, the morning train on the M. & M. Railroad, 10 miles away, sounded its whistle for a station. The sound of the whistle on the clear, thin air was faint and far off, but I thought it was the same sound I had first heard, so I started on," to an old building where he found a Porcupine. "Just then I heard the bawling sound which I had thought was the train. this time I was much nearer to it, and the sound increased in volume and ended in a roar, followed by a throaty growl. I knew what it was now, for many times I had heard old trappers telling how a Bear will bawl and roar when caught in a trap.

"The Porky was still waddling toward me, and as I wanted him for bait for the other trap, I shot him and ran to the top of the hill on the edge of the clearing, from where I could look down to my Bear trap. I stopped to listen, standing on the limbs of a fallen beech, about 6 feet from the ground. Down through the woods about 200 yards, I saw my Bear. He was standing facing me, both front feet up on a big log, his head swaying from side to side.

"I saw the Bear was well caught, high up on his right front paw, so I got out my camera, and made a number of close-up exposures. When the Bear tired of fighting the trap, he would stand or sit down, always facing away from me, and never looking at me. I went up very close to him, but contrary to most stories told of Bears' actions when cornered, this Bear was not especially ugly, nor did he show any desire to fight. When I poked him with my gun barrel, he would growl and snap his jaws at me, but he never even offered to come at me, or to even turn toward me. I have often killed Coons in traps, that showed much more fight," etc., etc., etc.[80]

But he omits to mention that this Bear had been held, tortured, and starved in that fearful grip of steel for several—possibly 10—days and nights.

However, the Bear that is trapped is not necessarily caught. One of

[80] Adirondack Bears, Forest & Stream, Dec., 1923, pp. 726–27.

the desperate expedients they resort to, is thus set forth by Potter. As he approached the place of his next trap set, "every 300 yards or so, I found trees with fresh claw- and teeth-marks on them, with the pitch still oozing from the torn bark. My trap was set right in the middle of this hogback, and the fresh trail was headed right along this ridge.

"As I drew nearer the trap, I had a feeling I would find another Bear in it, and from all signs, it would be a lot larger than the first one I had trapped. The teeth-marks on the trees were higher than my face, and I stand nearly 6 feet high. . . .

"I came to the pen and peered in, but the trap was gone. Gone also was the honey; but trap drag and bait were gone as if by magic, for not a stick or a leaf seemed to be disturbed. I looked around in every direction, but could not find where the drag had torn up the ground. Finally, looking off down into the swamp, I caught sight of the broken top of a spruce tree, showing up white against the green background of the other trees. That was something out of the ordinary, as we had had no storms since I set the trap, so I went down to investigate.

"There I found the story of my Bear written very plainly on the ground and in the tree. The trap and drag lay just one side of the tree, and the jaws of the trap were sprung. Alongside of the trap lay the top of the tree about 10 feet long and 3 inches in diameter at the big end.

"The Bear had climbed the tree with the trap and drag, and had jumped out when about 12 feet up, trying to free himself from the trap. The trap had caught around the slim trunk of the tree, and the weight of the Bear had released his claw, and also broken off the top of the tree. The tree was clawed the whole length, and the ground under it was all torn up. I had arrived about two days too late.

"This is not an unusual means for a Bear to free himself from a trap. I have heard of two or three other incidents very much the same as this one. However, a Bear can only climb a tree when he is caught by a hind paw instead of a front paw, and also only when the drag is such that he can pick it up and carry it."[81]

As general comment on Bear trapping, let me quote from the good old hunter-naturalist, Manly Hardy. He says in his article on this subject: "The trap was gone, but it was easy to follow the trail in the snow. The Bear had gone under logs and around trees, evidently trying to find something to hitch up to. I found him fast, after following about 40 rods. Getting so that he was head toward me, I fired at about 25 paces, putting the bullet exactly between the eyes. . . .

[81] Forest & Stream, Dec., 1923, p. 728.

"Many people think that a Bear, when in a trap, gets fast by accident, but any one who has ever trapped Bears knows that they try to get fast to something in order to pull out of the trap. Sometimes they will climb a tree, and getting the clog entangled, will throw themselves down, evidently hoping that their weight will tear their foot out of the trap. I have known of 4 such cases.

"In one, the Bear escaped by tearing a toe out. In the other three cases, the Bears were found hanging dead. I saw where one of them, by biting, had broken off the top of a large hemlock where it was more than 6 inches through, and the ground beneath was strewn with splinters as if the tree had been struck by lightning.

"Bears differ in disposition and mental capacity, as men do. Some, when in traps, are ugly, and some are clever; some will drag a trap to a ledge if one is handy, and will repeatedly smash the trap against the rock, trying to break it. I have known of cases where they succeeded. Some will drag a clog a long way, and some will pick it up, and by holding it under their arm, and walking erect upon the hind feet, will carry it a long distance without leaving any trail. If men who think that animals do not reason will try trapping Bears or Raccoons for a few years, they will observe some things which will surprise them."[82]

A curious and final item is contributed by W. J. Bignell. He says, after considerable chances to observe:

"Once in a while a Bear would break a chain and get off with the trap, and the final result of such a performance is usually the falling off of the Bear's foot at the point where the trap holds it, after which release, poor Bruin finishes his earthly pilgrimage more or less on three legs."[83]

The Horrors of the Bear Trap

In early days out West, I heard more than one tragic tale of a trapper getting caught in his own Bear trap. There, alone in the wilderness, he suffered all the horrors of a lingering, painful death. In some cases, the agony was ended only by slow starvation. Alas, I made no notes, and the names and dates have gone from me. But it is well known that these frightful things did happen from time to time.

Will C. Barnes, of the Forestry Department at Washington, vouches for the following: Two Forest Rangers in a Montana National Forest, were working their way up a very rough cañon. The only road possible led between two huge rocks.

[82] Forest & Stream, May 28, 1910, p. 850.

[83] Forest & Stream, Feb. 26, 1910, p. 333.

"On top of the rocks, spanning the opening, was a short pole, which they judged had been placed there for some purpose. Dismounting to investigate, they started through the narrow passage, but stopped short, for there before them on the ground was the dried-out carcass of a Horse, dead for many months. Its right front leg was fast in the powerful jaws of a huge steel Bear trap. Evidently, the person who placed the trap there had done so in the expectation that Bruin must pass through the gap, going either up or down the cañon. From the pole overhead hung a piece of baling wire, which they had not noticed at first. This wire came down to about 5 feet above the trap lying below it, and a loop in its lower end had undoubtedly held a bait of some kind—a Jackrabbit, a sage hen, or a piece of bacon. Swinging free as it did, any Bear passing through the gap, would have its eyes fixed on the bait above and thus blunder blindly into the trap cunningly concealed with grass and leaves.

"'An old-time trapper's trick,' remarked one of the rangers.

"But alas for the plans of the Bear hunter, this Horse, probably looking for water in the cañon, had started through the gap, stepped on the pan of the trap and had died, a helpless prisoner; for the 10 feet of the log chain fastened to the trap had a heavy log drag at one end, that could be moved only by a Grizzly, and then not far. The leg in the trap was broken, possibly by the snap of those giant jaws, possibly by the Horse in his hopeless struggles to escape.

"Both men at once recognized the Horse as one lost by a hunting party several months before, for although badly torn by Bears and other wild animals, enough was left of the desiccated hide to show its colour and the brand on its left hip."[84]

The same well-known member of the Forestry Service sends the following:

"Many years ago in southern Utah, a Mormon boy set a Bear trap at a carcass which showed signs of having been visited by Bear the night before.

"In some way as he stepped off, his spurs caught together and locked, throwing the boy flat on his face, his right arm striking the pan of the trap with such force as to spring it. Fortunately he wore a heavy shirt and a leather coat with sheepskin lining. This muffled the crushing force of the trap jaws so that no bones were broken, but with one arm caught above the elbow—and that the right—he was unable to spring the trap sufficiently to release it. He worked for two hours in an agony of fear. Sweat blinded him, and the grip of those steel jaws caused him intense suffering.

[84] Sat. Eve. Post, Dec. 6, 1924, p. 14.

"Finding it impossible to release his arm, he managed finally to get the heavy trap and chain swung over one shoulder. Thus encumbered, he started toward his Horse," which took fright and ran off.

"At daylight the next morning, the plucky lad fell in a pitiful heap at the gate of a ranch house about 10 miles from where the accident occurred. His arm was a terrible sight, and for some days it was a question whether or not it could be saved. He fully recovered eventually, except that he never had the full use of the injured member."[85]

One naturalist only, Major Allan Brooks of British Columbia, has raised his voice in defence of trapping. He maintains, first, that the Bear does not suffer nearly so much as one of us would, in similar circumstances; next, that hog-raising in primitive regions is nearly impossible if Bears are numerous; and the only effective way to combat the Bear is with the steel trap. Brooks's article is quoted at length in the section on food under the caption "Hog-killing Bears."

The Usual Hunt

Lying on my table now is a vast number of clippings and articles from standard magazines, relating more or less thrilling Bear hunts. As I look them over, I realize that they are all built on one pattern; they differ only in trifling details.

First, we have a more or less wealthy man from the city, who hungers for the sporting thrills of a Bear hunt; next appears the experienced native guide, with a mixed pack of very mixed Dogs, trailing hounds and Airedales, that is, clever mongrels with traces of hound blood, and Dogs of complex ancestry. Then we have the early start, the cold trail announced by the "houn' Dawg," the hot trail, the clamour of pursuit, the five-mile run, the Bear at bay, the cautious approach of the intrepid but nearly blown hunter, the short-range shot, so as not to endanger the leaping, yelling pack, the sinking down of the giant, rugged form—Goliath smitten between the eyes—the hours of hard work by the guide to save the hide, and at last, the long, growing, and ever-brightening yarn at home or in the club. Why not? Was it not for this that he came?

Over and over we have it, just the same; and I realize that I also would have done that very thing had I had a chance when I was young. But now, with ripening years and other dreams, I have a different measure of values. I have read all these bloody, yelling yarns, hoping to find in them something of permanent worth, but find it not, so pass them by.

[85] Sat. Eve. Post, Dec. 6, 1924, p. 153.

Food, Chiefly Roots and Berries

"All animals are omnivorous, especially the Blackbear," might properly have appeared in a certain celebrated essay on animals. The Bears, like the Coons, are quite omnivorous at all times. The Muskrat will eat flesh if starving, but prefers vegetables at all times. But the Bears and Coons prefer all things eatable at all times, without asking whether they be animal, vegetable, or unholy man-made compounds. A list of the Bear's staples, is not a list of what it likes, but of what it can get.

During the early spring, the chief supply of the Blackbear is roots. In Manitoba they are said to feed on the roots of the Sand-flower or Prairie Crocus (*Anemone patens*) and the Indian Potato (*Psoralea esculenta*). In the mountains, the hunters described the earliest spring Bear food as a fibrous white root which I could not identify. To this are added grass shoots, bark of young trees, any insect, and every stray Mouse or morsel of carrion that the hungry one can pick up.

The food of the Akron Bears, already cited, produced such good results that I quote at length Baker's account of it:

"The food which is supplied to the Bears is a very good approximation to the diet which the animal gets in the wild state. Hotel and picnic tables of the park afford a large amount of miscellaneous scraps, to which is added an abundance of green food from farms near by. This begins with dandelion tops in the spring, followed by clover, green corn, watermelon, berries, and other fruit. Acorns are gathered for them in the fall, and they then get, also, dried sweet corn and 'windfall' apples. Occasionally, a venturesome hen or pigeon is eaten, but the Bears get no other meat except a little that has been cooked."[86]

What tremendous emphasis this list, with its success, lays on the need for variety.

An abundant spring food-root in much of the Bear's range is the arum; and, so far as other vegetarians are concerned, it is probable that the Bear is welcome to every root of the kind it can find in the woods. I know of no other creature that can stand its pungent terrors.

Bachman comments thus on the habit:

"Perhaps the most acrid vegetable eaten by the Bear is the Indian turnip (*Arum triphyllum*), which is so pungent that we have seen people almost distracted by it when they had inadvertently put a piece in their mouth."[87]

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[86] Further notes, pp. 3–4.

[87] Q. N. A., III, p. 190.

Richardson, when on the Churchill River in 1848, was shown a root that evidently supplied the Bears with food. He says of it: "The *Actaea alba* grows abundantly here. It is called by the Canadians *le racine d'ours*, and by the Crees *masqua-mitsuin* (Bear's food). A decoction of its roots and of the top of the spruce fir is used as a drink in stomach complaints."[88]

On the Slave River in June, 1907, I found the Bears' stomachs crammed with buds and leaves of aspen, and of *uva-ursi*, as well as vast quantities of the uva-ursi or bearberry pits. All the Bears' dung noted that summer—and it was plentiful—was filled with these pits.

Berries now begin to ripen, and furnish another bountiful resource. Strawberries, blackberries, and raspberries allure the Bear from other foods, and strike an equitable bargain for their gifts. In return for their delicious pulp, the Bears scatter excrementally the unimpaired seeds of these fruits, and thus sow the waste places near and far. Consequently, when the conditions become at all favourable, there is an abundant supply of berry seed to take advantage of the opportunity. Thus a region devastated by fire is immediately and unwittingly sown with berry seeds by the Bears, who, however unconscious they may be of their share in the planting, are not slow to come and glean their own harvest.

On the upper Red River, in 1800, when Blackbears abounded, Henry writes, Sept. 22 of that year: "Bears make prodigious ravages in the brush and willows. The plum-trees are torn to pieces, and every tree that bears fruit has shared the same fate; the tops of the oaks are also very roughly handled, broken, and torn down to get the acorns. The havoc they commit is astounding; their dung lies about in the woods as plentiful as that of the Buffalo in the meadow."[89]

In the autumn, showers of beechnuts, acorns, and other such food add a new staple to the Bear's diet.

In Texas, according to Bailey, the Blackbear feeds much as elsewhere, on every kind of root and fruit available, except that he has here become too fond of pork—which item is further discussed in the section on Hog-killing. In the Texan Report, we read:

"The first berry to ripen in summer, Mr. Carter says, is on the 'grand-daddy graybeard' bush (apparently *Amelanchier*) of which the Bears are very fond. Blackberries and huckleberries are abundant summer food for Bears. Later the sour gum (*Nyssa sylvatica*) is a favourite food, and nearly every sour gum tree in the woods has its top branches bent and twisted, and its bark well clawed. . . .

[88] Arc. Search Exped. of 1848 (1851), I, p. 82.

[89] Journ., p. 101.

"While hunting, I found numerous Bear beds and old and fresh 'signs,' some composed of acorns, some of sour gum and other berries. We also saw half-chewed acorns where the Bears had been feeding. During summer, the Bears feed extensively on Pigs belonging to the settlers, but in December, both Pigs and Bears were rapidly fattening on the abundant acorn crop."[90]

A fair summing up of the Blackbear's diet is: berries, fruit, roots, and vegetables, with insects as a variant; also, flesh, carrion, and fish, when he can get them.

Cascara Works Quickly

The following suggestive item also is supplied by Vernon Bailey:

"In the coast country of Oregon and northern California, the pigeon berry, or cascara (*Rhamnus purshiana*), grows to a good-sized tree and late in summer, is often loaded with large, purple berries, a favourite food of band-tailed pigeons. They are sweet and juicy, with a flavour neither wholly agreeable nor wholly unpleasant to my taste, but they seem to be palatable to many birds and mammals and even when salal, salmonberries, and blueberries are ripe, the Bears occasionally eat them.

"In the fall of 1909, near Coos Bay, Oregon, while following a dim trail through the forest, I came to a small cascara tree, much torn, scratched, and broken, with the top branches pulled down and turned in, most of the berries gone, and Bear trails leading to and from it through the tangled bushes. A tree of that size should have had a half bushel of berries, but there were only a few handfuls left that had escaped the Bear's vigorous search.

"The medicinal properties of the berries had evidently begun to take effect before the Bear got down from the tree, and the trail leading away through the bushes, as far as I followed it, demonstrated their cathartic efficiency. There was no question of what the Bear had been eating, for skins and seeds of the berries, and even some whole berries that had been hurriedly swallowed without being crushed, were strewn along the trail. The Bear had evidently eaten in a hurry and gone away in a hurry.

"I have often wondered if that old Bear knew that he was taking medicine, or whether he just took it because he liked it. Had he been living too long on tanbark oak acorns and felt the need of a change of diet, or did he just make a Pig of himself, and get an overdose of these sweet berries?"[91]

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[90] Texas, pp. 190–91.

[91] Journ. Mamm., Feb., 1923, pp. 53–54.

Feeds on Mayflies

In many of the northern lakes, a new food supply is added in the myriads of mayflies that are drowned and washed up on the beach. About Shoal Lake, Man., the residents assured me that in some seasons the shores of the lake are covered with a pile of dead mayflies, 6 feet wide, 6 inches high at the highest point, and about 20 miles long.

E. A. Preble, in his notes on the Blackbear in Keewatin, writes: "One was seen near Robinson Portage by Mr. W. C. King, who passed this point a day or two ahead of us, on his way towards York Factory. This Bear was feeding on the piles of mayflies (*Ephemeridae*) which perish in myriads and are washed up on the shores in long windrows. These are said to constitute a favourite food of the Bear."[92]

Hearne says of the Blackbears he killed between York Fort and Cumberland House: "Their flesh was abominable. This was in the month of June, long before any fruit was ripe, for the want of which they then fed entirely on water-insects, which, in some of the lakes we crossed that day, were in astonishing multitudes. [Footnote says, "lying in putrid masses to the depth of 2 or 3 feet."]

"The method by which the Bears catch these insects is by swimming with their mouths open, in the same manner as the Whales do when feeding on the sea-spider. There was not one of the Bears killed that day, which had not its stomach as full of these insects (only) as ever a hog's was with grains, and when cut open, the stench from them was intolerable."[93]

Feeds on Ants, Wasps, Bees, and Fish

Throughout the summer, all kinds of insects, and especially ants, are important Bear food.

In the sandhills around Carberry, in the woods about Lake Winnipegosis, throughout the Bitterroot Mountains of Idaho, and on the ranges of the upper Yellowstone, as well as in the Rockies of Colorado, and the Low Laurentians of the upper Ottawa, ants' nests furnish the Bear with an important article of food. Following the trail of one, I have found that it invariably turned over every log and flat stone that it came to, and ripped open every rotten log and stump, in its search for insects, the greater part of which must have been ants. Among the Bitterroot Mountains I have, in a single day, passed hundreds of these demolished logs and stumps.

Similar testimony is offered by Merriam and Enos A. Mills.

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[92] N. A. F., No. 22, 1902, p. 64.

[93] Journey, 1795, p. 370.

A pleasing variation of late summer foods is found in the nests of several species of wasps, as well as of wild bees and ants. Vernon Bailey supplies many details of the damage done by Texan Blackbears to the hives of the cultivated bee in that State.[94]

James M. MacKenzie, the Bear hunter of Bakersfield, Calif., has given me a most amusing picture of a Blackbear robbing a bee tree. The angry bees swarm about his face and sting most vigorously. The Bear bawls with pain, but keeps right on gobbling the honey, wax, bees, and all. More than once, he was led to a Bear in the middle of a honey feast by the loud bawling with which he acknowledged his punishment, but evidently thought the game was worth it.

According to Merriam, the Bear "digs out the nests of the 'yellow-jackets,' devouring both the wasps themselves and the comb containing their honey and grubs. So fond is he of honey that he never misses an opportunity to rob a 'bee tree,' manifesting no fear of the bees that angrily swarm about him, his thick hair and tough hide protecting him from their stings."[95]

Similar testimony is given by Capt. J. P. McCown,[96] who observed the Blackbear in Tennessee.

On Sept. 21, 1905, at Lake Caughnawana, 40 miles east of Kippewa, Quebec, I found that a Bear I was tracking had stopped at a rotten log to dig out a wasp's nest a few minutes before; the comb, in pieces, was scattered about, and a number of the yellow-jackets hovered angrily over the ruins of their home. There can be little doubt that he heard me coming and had cleared out before I sighted him.

As summer wears on, the Blackbears of the Pacific water-shed have a new supply in the myriads of salmon with which every clear stream is teeming. And those of the East find a corresponding, though smaller, resource in the suckers and other swimming spawners.

George H. Measham, of Winnipeg, writes me: "Bears show much intelligence when fishing, and have high jinks when suckers and pike make their great annual pilgrimage up stream in the spring. It is mostly suckers that they catch. When trout fishing on a small stream tributary to Lake Superior, I once had a treat watching a mother Bear and two cubs at work. There was a still deep pool below a little fall, and here a shoal of suckers had lingered after their spring migration. The water gradually shallowed from the fall to the lower end of the pool, which consisted of a gravel bar

[94] Texas, pp. 189–90.

[95] Mamm. Adir., pp. 95–96.

[96] Q. N. A., III, p. 195.

thrown up in flood time. The cubs were stationed here. The old lady had posted herself on the edge of the fall, and once in a while, would roll down a great rock with a resounding splash. This would cause the suckers to skirt the shallows where the cubs were waiting. They rarely missed raking out a sucker when the fish came close enough in their circuit of the pool. The direction of the wind and the noise of the fall favoured me in obtaining this pretty picture of wild life."

Autumn arrives with its consummation of seasonal abundance—nuts, berries, and flesh. It gives all wild creatures a necessary chance to gather for the coming cold. All work hard to profit by the opportunity, storing inside their skins or dens, as their custom may be; and none work harder or more successfully than the Bear.

He labours without ceasing till nature comes with the snow clouds and abnormally ends the feast by spreading the white cloth.

Colder weather, deeper snow, and scarcer food at length unite in peremptory order to the Bears—"Go now and den for a time." First to obey are the females, that must have a good abode suitable for nursery, rather than a mere storm-break; last the males, that are content to rough it, and by being late to bed and early to rise, get that much more out of life. When the Winter King is reigning supreme, there is no evidence of such a thing as a Blackbear in the woods.

As Carrion-eater and Sheep-killer

We have seen that the Blackbear is omnivorous and, are not surprised, then, that he should be fond of carrion and lose no opportunity of feeding on it, be it never so rank, putrid, and maggoty.

On the face of this, it is a most beneficent habit. It has indeed won for the Blackbear many friends. Thus, the editor of *California Fish & Game*, July, 1920, p. 126, says:

"Interest in Blackbear protection is always increased at the time of a blackleg epidemic, in that the Bears can be depended upon to eat up Cattle which have died from blackleg, thus helping to prevent the spread of disease. Residents of Tuolumne County in past years, have been wide awake to this benefit conferred by the Blackbear."

It is well known that on the Sheep range, the Bears clean up the carcasses of those killed by accident or disease. But there is a hazard in such a habit.

First, the Bear acquires a taste for mutton; and it is easy to graduate from eating dead Sheep to eating them so nearly dead that they cannot get away. And so he may become a confirmed sheep-eater. A case of

this kind is recorded by L. N. Lorenzen, Grazing Examiner, in *California Fish & Game*, for Oct., 1923, pp. 151–53. He supplies in full detail an account of a big Blackbear that used to hang around the Sheep camps of Nelson Creek, northern California, and kill a Sheep every other evening. With her, were two cubs that she was feeding on mutton and raising in the creed of Sheep-eating. Of course, there is only one remedy in such a case—kill the marauder. The writer takes occasion to point out that many Sheep-herders teach the Bears to eat mutton by leaving dead Sheep unburied where Bears can find them.

Hog-killing Bears

The most serious of all charges against the Blackbear in newly settled country, is his readiness to acquire a taste for pork. Bailey, in his "Texas," relates the impossibility of running a Hog ranch in Bear country until the Bears are cleared out.

"The number of Hogs killed in a year," he says, concerning the Carter Ranch, "could be only approximately estimated, but Mr. Carter thinks the Bears sometimes got nearly half of the Pigs, and many of the Hogs. Pigs were their favourite prey, and were easily caught, but the Bears took anything they could get. One large 4-year-old boar was killed and partly eaten only a mile from the house.

"As soon as acorns began to fall, the Bears would feed on them, and let the Hogs alone for a while, but during spring and summer, pork was their principal food."[97]

In direct conflict with the foregoing and under similar general conditions, is the following by Grinnell and Storer: "In Hetch Hetchy Valley, Mr. C. C. Bull has told us of Bears visiting Hog pens and feeding in the troughs alongside of the rightful partakers, without molesting or disturbing the latter."[98] Which is another proof of the enormous individual variation in this species, in disposition as well as in physical features.

The most sweeping attack of all, perhaps, is by Major Allan Brooks of Okanagan Landing, B. C. He charges the Blackbear with being an inveterate Hog killer, at least under some circumstances, and justifies the use of steel traps as the only effective offset. He says: "When I came to the lower Fraser Valley, B. C., in 1887, Bears—common black and 'cinnamon' Bears—were very abundant, and extremely destructive to Hogs, so much so that they put many Hog ranches out of business. A neighbour of ours lost $400 worth of Hogs in one season and quit. . . .

[97] Texas, pp. 190–91.

[98] Animal Life in the Yosemite, 1924, p. 67.

"Two or three men then started to trap the animals, and in a few years, reduced their numbers so that ranchers along the foothills were once more able to raise Hogs."

A Defence of Trapping

"After seeing many Bears in steel traps," continues Brooks, "the conclusion was forced upon me that their sufferings were very different from those of a human being in a similar predicament. Rage and fear, rather than pain, seem to drive them to the frantic exertions that often end in their tearing loose, and I have never seen them bite themselves in any part of their anatomy except the foot in the trap, and that only rarely.

"To show that their sufferings are far less than might be imagined, let me cite a case.

"My partner trapped a Bear on his ranch, late in September, which got away, leaving one fore paw in the trap; it must have gone into hibernation not later than one month afterward, yet he caught this same Bear in the same trap the following April, and it was *rolling fat.*

"Any one would think that the suffering entailed on wrenching off a paw at the wrist joint would reduce the animal so much that it would have difficulty in surviving the winter's hibernation.

"Bears are not supposed to molest Deer, but I know what would happen if one of them came across a newly dropped fawn, and I know of one case, at least, where a Bear killed a full-sized and vigorous Mule-deer.

"Deadfalls are clumsy and ineffective at best and the steel trap will always be the principal means of taking predatory and fur-bearing animals.

. . . . . .

"In conclusion, [I] would like to say that, while I deplore the barbarity of the steel trap, it still should be regarded as a necessary evil, as it is in many cases the only way a rancher can protect his stock, or the lumberman his supplies for the winter campaign."[99]

In brief, Brooks maintains that nothing but persistent trapping with big steel traps made Hog raising possible in his part of British Columbia during the early days.

The explanation of this unusual and perverted appetite is found in the last two words: "early days"; that is, the days when the settlement was small and surrounded by a vast wilderness. If my Hogs were being raided by Bears, I should, of course, do what I could to destroy those particular Bears. But I should know quite well, first, that it was done by individuals

[99] Forest & Stream, Jan. 10, 1914, p. 47.

of unusual audacity; second, that a little hunting would soon impress on the Bears the terrors of men and guns so completely that all raiding would cease. Experience shows that Bears quickly learn to avoid the haunts and property of man.

The Bear and the Boar

A friend of mine in England had an uncle, Joseph Backhouse, who spent some years of the early '50's in the backwoods of southern Michigan as a settler. These were the days when Bears and Deer were abundant, and also when droves of half-wild razorback Hogs roamed through the woods and maintained themselves on the bounteous supply of nuts and berries.

One day, in the fall of 1850, Backhouse heard a terrific bawling and squealing in the woods ahead. He approached with the utmost caution, and presently glimpsed an amazing situation. A Blackbear was trying to catch a small Razor Hog which squealed lustily, and in a few seconds the mother of this with many other Hogs and, above all, a huge old Boar, assembled at the cry for help.

The Hogs bunched back of some logs and brush, the mothers outside and the little ones peeping fearfully from under the mothers' bellies, while out in front, facing the Bear, was that grim old Boar. The Bear was not anxious to try it out with the Boar. He hoped to seize and carry off a fat piglet without danger or much effort. Doubtless, he had done so before. However much he might circle about the drove, he always met that resolute old Boar between.

Then he made a rush at the Boar and, for a moment, they grappled in mortal close. The Boar was battered and clawed, but the Bear had several long rips from the Boar's white, gleaming tusks, slashes deep and bleeding.

Again the Bear sought to seize a "roaster," but ever that grim old Razorback stood between, with menacing scimitars in view, as he chopped his foaming jaws, and uttered deep, savage grunts.

After much circling and many repulses, the Bear made another attack on the Boar, and, as they struggled and slashed, the whole herd of mothers and younger Boars rushed forth. They fell on that Blackbear with their scores of keen-edged ivory knives. They never ceased till they tore the flesh from his every limb. Nor even then did they rest, till, in their final fury, they consummated the triumph with a banquet. Nothing was left of the Bear but the bigger bones, raw scraped and bloody.

As Moose-killer

While the great bulk of evidence is on the side of proving the Blackbear to be a vegetarian by choice, we come up with a shock against testimony that would classify it as a predacious carnivore, a big-game killer of the largest pretension; that is he sometimes kills a full-grown Moose.

The evidence is supplied by no less authorities than Campbell Hardy, Henry A. Braithwaite, Theodore Roosevelt, and B. A. Eastman.

Hardy says: "I have been told by an Indian of a scene he once witnessed in the woods when resting on the shore of a lake before proceeding across a portage with his canoe. A crashing of branches proclaimed the rapid advance of a large animal in flight. In a few moments a fine young Moose, about half grown, dashed from the forest into the lake, carrying a Bear on its shoulders, and at once struck out into deep water. The two were soon separated, and the Indian, at the same time launching his canoe, succeeded in wounding the Bear, which, seeing the man, had turned back for the shore. The Moose escaped on the opposite side."[100]

In like tenor Henry A. Braithwaite says: "I know they kill Moose, Caribou, and Deer.

"Once in summer while looking out at a new trail following up a deadwater, I found large Bear tracks going in the same direction as a Moose was going. I paid no attention to it, as it is quite common to see such tracks, but after travelling between half and three quarters of a mile, I heard a loud noise. . . . I went in the direction of the noise, and shortly heard it again. I got to the place as soon as possible and found a large Bear had a Moose down. . . . I didn't stop long to look, but put two bullets through the Bear and broke up the fight. The Moose's back was broken, and his neck was badly mangled, so I knocked him on the head and cut his throat to end his misery."

To this, he adds details of two Bears trailing and hunting two Moose, with apparent success.[101]

Roosevelt says: "They will even attack and master that formidable fighter, the Moose, springing at it from ambush as it passes, for a bull Moose would surely be an overmatch for one of them if fronted fairly in the open."[102]

Somewhat similar testimony is offered by B. A. Eastman of Barre, Vt., who writes me, April 3, 1924, concerning an episode witnessed in Northern

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[100] Forest Life in Arcadie, 1869, pp. 203–04.

[101] Forest & Stream, Jan., 1925, pp. 9, 51.

[102] Wilderness Hunter, 1893, p. 263.

Canada: "Just at sundown, we reached a small pond, where we were to call for Moose. At the instant of our arrival, 2 cow Moose plunged into the water and commenced to swim rapidly across the pond. Immediately after, a Bear entered the pond in hot pursuit, not over 75 feet behind them. When they reached about midway, a well-directed shot hit the Bear in the mouth, which caused him to turn and swim back to the shore where he had entered the water; another shot killed him. . . . He was very old and had lost several of his teeth."

Notwithstanding such strange perverts, such apostates from the creed of their people, the Blackbear is primarily a root and berry eater, and most good naturalists are in favour of the Bear. A. W. Anthony, the well-known field man, writes: "I want to place myself on record with Jay Bruce as a friend of the Bear. For many years, I was on the Sheep Range of eastern Oregon, where Blackbears were common, and where I had every chance to hear the stockman howl about his loss. I often investigated the matter and have never yet found a clear case of killing by the Bear."[103]

There can be no doubt that the sheep-killing Bear is unusual, a pervert, an individual freak. But he occurs, and the answer to the problem is: Shoot him. But do not, for his rare and unnatural transgression, declare war on his harmless race.

This is the attitude of nearly all authorities to-day, and will sufficiently explain the apologetic note in the subjoined statement by the Biological Survey: "The following predatory animals were taken by hunters under the direction of this bureau during the present year: 849 Wolves, 26,241 Coyotes, 85 Mountain Lions, 3,432 Bobcats, 30 Lynxes, and 41 Bears. Every effort is being made to have the predatory-animal hunters kill only such Bears as are known to be destructive to live stock. A small number of Bears, however, unavoidably fall victim to traps set for other animals."[104]

How He Stores Food

Throughout the rest of the summer and autumn, their energies are devoted to getting fat. The Woodmouse and the Squirrel store up hordes of choicest food in holes and caves; the Bear and the Woodchuck store it up in their own skins. Autumn with its plentiful nuts, in addition to many other foods, affords the opportunity, and the Bears lose not a minute. Night and day they work, their stomachs are distended to the full, but amazingly good digestion waits on boundless, unbridled appetite, and the Bear grows daily rounder.

[103] Cal. F. & G. April, 1923, p. 59.

[104] Rep. Biol. Surv., Aug. 29, 1918, p. 3.

Fur is a wonderful protection from the cold, fat is as good. The Bear has four inches of each when winter comes; little it heeds the storm. And yet this, of all the big forest beasts, the best protected, is the only one to shun the battle with winter and seek a safe and sheltered den, there to sink into the sleep that lasts till spring.

The only case I find of a Blackbear making a cache of surplus food, is related by Osgood. It took place on Sept. 13th, in the MacMillan region. The food in question was a Moose carcass.[105]

Fight Among Themselves—Cannibals

That they do, at times, settle their differences by mortal combat, is evidenced by the following, related to me by Edmund Nagle, the fur-trader of Athabaska Landing: "In the October of 1877," he says, "I was out walking near the Landing, when, across a lake, I saw two Bears approaching each other—a 2-year-old and a bigger one. When they got near, they began shying around each other in silence, then 'woof-woofing.' Then they grappled and rolled over and over. Before I could get round to the place, the little one was killed, and his bowels torn out. The dark marks of the big one's hug were across his back when we skinned him. The Indians say that such fights often occur."

There is—there always must be—a dark and final chapter written in any discussion of the food affected and sought after by an animal that is in any degree carnivorous. Soon or late, it will be convicted of cannibalism.

George Crawford (Mitigwab), my Indian guide from Kippewa, told me of a case that he observed on the Upper Ottawa, about 1890. He tracked a very big Bear in the snow to where it had hunted out another that was already denned up, and had devoured it all but the jaws. The big fellow had feasted for two days, sleeping in the den of the victim and coming out only to eat, or else to drop dung, of which there was an immense quantity outside.

This, however, is nearly as rare as cannibalism in our own species.

The Harmless Blackbear

Little by little, the public has become convinced of the harmlessness of the Bear. Having disposed of the idea that he is a menace to human life, we now realize that his destruction of property is practically *nil.* Not Bears, but Dogs it is that usually kill the Sheep; not Bears, but boys chiefly

[106] N. A. F., 30, 1909, p. 81.

rob the orchard; not Bears, but poachers are oftenest responsible for the dead Deer that show unmistakable signs of having been torn by a Bear.

Seth E. Gordon, Secretary of the Pennsylvania Game Commission, writes on this point: "The fear that a material increase in the number of Bears will seriously interfere with a proper increase in other game, has been absolutely contradicted in Pennsylvania; because other game, especially Deer, have increased quite rapidly in the same territory where Bears are found most plentiful. For comparison, the kill of Bears and male Deer in Pennsylvania, over a period of years, during which period the laws protecting them were constantly being made more restrictive, was as follows:

	1907	1915	1918	1919	1920
Bear	200	188	387	472	420
Deer (males only). .	200	1,287	1,754	2,913	3,300

(On and after 1915, trapping for Bear was prohibited, and number limited to one each person.)

"Indications are that the kill of Bears in Pennsylvania this year will run upwards of 500, while the kill of legal bucks, with antlers at least 4 inches long, will run considerably over 4,000."[106]

As to the killing of Hogs, that passes away as the country is settled, and the Bear acquires a wholesome dread of the things that are associated with man.

As these facts have become known, all bounties for killing Bears have been withdrawn, and the Blackbear transferred from the category of vermin to that of high-class game.

In Pennsylvania, where enlightened game protection has been most successfully carried on, the Legislature of 1911 prohibited the use of steel traps and deadfalls for Bear. Pens were still allowed, but had to be visited every 48 hours.

The Legislature of 1915 reduced the open season to 2 months, Oct. 15th to Dec. 15th, abolished the pen traps, and limited the bag to one Bear per hunter; thus completing its enthronement as a first-class and desirable game animal, to be killed only in fair open chase with Dog and gun.

In the West, the Wild West, where every man slaughters, or used to slaughter, every wild thing that did not carry his brand, the new estimate has come for the Bear; and Supt. C. G. Thomson, of the Crater National Park, found, in 1923, that of 81 cattlemen interested, only 5 were opposed to protecting the Blackbear.

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[106] Bull. Amer. Game Prot. Assn., Jan., 1922, p. 4.

Never Attacks Man

Timid, shy, and inoffensive is this animal. A dangerous Blackbear is much less frequent than a dangerous Dog or Bull. I have met scores of Bears in the woods, and, almost without exception, they fled like Rabbits as soon as they knew I was near.

The popular notion of the Blackbear being a fierce and aggressive animal is so far wrong that I am tempted to lay it down for law that no Blackbear ever willingly faced or harmed a man.

Seth E. Gordon, Secretary of the Game Commission of Pennsylvania, says: "We have yet to find a single authentic case in Pennsylvania, where a Blackbear actually made an unprovoked attack upon a human being.

"A badly wounded Bear, when closely cornered, or an enraged female with young cubs, are both to be avoided. In a few cases of this sort, we have found that the Blackbear will attack a human being, although the mother Bear with young cubs rarely attacks, unless a cub is captured, and calls desperately for help."[107]

Negative evidence of this kind could be gathered in unlimited quantity. Then, as usual, we are confronted suddenly by some extraordinary exception that seems to unhinge all our rules. Many blood-curdling Bear stories I have heard, examined, and found baseless; but the following has so far stood the test. It looks like a case of deliberate ferocious attack on man, and as such it stands alone.

Bear Kills a Man

J. H. McIllree, of Regina, Sask., writes: "This is the first instance I have known of an unwounded Bear attacking a man, and the only instance of any Bear making a meal of his victim. The Bear had doubtless very recently come out of his winter quarters. The occurrence took place at a lumber camp on the Red Deer River, 30 miles south of Etiomami [Alta.], a station on the Canadian Northern Railway.

"On the morning of May 17 last, two men, named McIntosh and Heffern, were chopping wood on the bank of the river, close to the cook shed. They noticed a Bear on the opposite side of the river, and called Wilson, the cook, out to see it. The Bear walked into the river, swam across, shook himself, and then made a rush for the men, who ran for the cook house, about 10 yards away. Wilson was leading, and was going so fast that he could not turn into the door, and shot past. The other two men managed to get into the cook house. Wilson kept on round the house,

[107] Bull. Amer. Game Prot. Assn., Jan., 1922, p. 3.

the Bear pursuing him, and when just opposite the door again, caught up with him, and struck him across the back of the neck with one of his paws, apparently breaking Wilson's neck.

"McIntosh hit the Bear with a can of lard, and Heffern with a cant hook, but the brute took no notice of them and picked up Wilson's body in his mouth and carried it about 5 yards away. The men ran to the main camp and got a revolver, and fired 10 shots at the Bear, the only result being that the Bear picked up the body again, and carried it to the bush, about 100 yards away."

On the arrival of a man with a rifle, the Bear made off, and escaped.[108]

This amazing incident was fully investigated by Dr. William A. Bruette, editor of *Forest & Stream*. In the issue for Feb. 8, 1908, p. 214, are given the results, together with the affidavits of the witnesses, W. Heffern, J. McIntosh, and the Mounted Police Officer, B. Belcher, who reported the affair. There can be no doubt of its truth.

Those who know the Blackbear are unanimous, when they hear this story, in adding by way of explanation: "That Bear was mad, mad as a rabid Dog, mad as a rogue Elephant, that tears to pieces and devours his human victim."

Other exceptions to the rule may be these: A captive Bear that has through daily association, lost its fear of man and, through cruelty, begotten a hate of him; a female whose young are threatened; and finally, a wounded, cornered, crippled, or otherwise disabled Bear, which will fight just as surely as a Rat or a Chipmunk will in like conditions.

In the following incident, just received from Canada, the Bear was shot at by the man, was wounded and at bay. Moreover, the wretched brute was driven insane by the agony of a multitude of Porcupine quills that were festering and working into its face and neck.

"Fort William, Ont., Nov. 17, 1924. Further details of the death of the Finnish trapper, A. Waino, killed by a Bear, 7 miles from English River station, are to hand on the return of the coroner, Doctor Boyd, with the body. Before the doctor reached the scene, the Bear, which was a monstrous black one, had been killed by a brother and two brothers-in-law of the dead man, who found the brute returned to the body of Waino and gnawing at the remains. . . .

"It was found that his face and neck were covered with Porcupine quills, which may have accounted for the Bear being in a dangerous and irritable mood and unable to hole up in his den. Waino's rifle

[108] Forest & Stream, June 22, 1907, p. 974.

was found with one shell discharged, while the lever had jammed in ejecting it."[109]

Notwithstanding a tale that has found great currency in the forbidden literature of the school-ground, no man, not John L. Sullivan himself, armed with only feet and fists could successfully battle with a Bear. When cornered, or forced to fight, even a small Bear is a dangerous enemy. A full-grown Bear can disable a Dog or a man with a blow of his paw. With his jaws, he can crush ribs and limbs. But his claws, sharp and driven by muscles of far greater power than those of the strongest man, are his truly terrible weapons. Against these, no unarmed man, however strong, has the slightest chance in combat.

But normally, he is as peaceable as he is strong; there is little need to fear the Blackbear when you meet him at large and give him a chance to get away.

The Timid Mother Bear

It is generally agreed that the mother Bear is ready enough to attack any man who molests her cubs. But even this idea must be modified, if we attach due weight to the only positive testimony available.

"Back in the '80's," writes B. Horsford, of Springfield, Mass.: "I was out gathering spruce gum, with a bag on my shoulder, and found two small cubs rooting around. I went for them as worth more than gum, thrust them into the bag, made tracks across a hollow, and was just going out of sight over the hill beyond, when the old Bear saw me. I ran, and she ran. Being the longer winded, she gained, and the distance between us grew fearfully less. Loaded with the cubs, I was obliged to stop to catch breath. She came close up, and when I started again, I stumbled and fell. . . . But I held on to the bag—there was money in it—regained my feet, the old Bear running by my side till I reached the house. Up the steps I ran and slammed the door in her face. She knew I had the cubs and didn't touch me, for fear of hurting them. . . .

"The old Bear was a suppliant, not an antagonist. 'Give me back my cubs—give me back my cubs, I do not want you,' would have been her cry had she possessed language; and when the door was shut, she turned sadly away."[110]

As a last word on the subject, I add the following by Dr. G. B. Grinnell: "Captain George S. Anderson—now Colonel Anderson of the General Staff—at that time Superintendent of the Yellowstone National Park, was

[109] Ottawa Evening Citizen.

[110] Forest & Stream, Sept. 17, 1910, p. 453.

driving through the Park in a four-mule ambulance, and at a point about one mile west of the lake hotel on the road to the Thumb, his team drove close to an old Blackbear and her two cubs. The mother Bear was catching trout for her young, out of one of the very small streams that run into the lake. The fish were running up the stream to spawn and, the water being low, were held in pools, and the old Bear scooped them out, pounced on them, and gave them to the young ones. The old Bear had not yet seen the wagon."

Telling the driver to stop, Captain Anderson went after the Bears. All ran off. Soon, the cubs climbed a low pine, up which the driver followed. He threw down the cubs to Anderson, who put them in a sack.

"Meantime the old Bear, her tongue hanging out, white teeth glistening, and hair all turned the wrong way, charged on Captain Anderson as if to make only one mouthful of him, but by the time she had come within 25 or 30 feet, her advance became more deliberate, and then she stopped. While Captain Anderson was putting the cubs in the sack, the old Bear champing her jaws, would charge up closer, perhaps within 20 feet. Captain Anderson had picked up a stick, and when the old Bear rushed toward him, he started toward her, and when he did so she always ran away, to return again, as the pursuit ceased. After the cubs had been secured and the men had got into the wagon, as they drove off with the cubs, the mother stood in the road and watched them as far as they could see her."

In conclusion, Grinnell says that if he had to live the next ten years in Bear country, "there would be much more danger of being struck by lightning in that time than of being injured by a Blackbear."[111]

During the days I spent among the Bears of Yellowstone Park, especially amid the garbage piles, I saw many cases of Bears fighting among themselves. In one the mother Bear, old Grumpy, faced the old Grizzly in a lively fight on behalf of her cub, Little Johnny. But never once did I see a Bear confront or threaten a man.

As the inevitable exception which bids us beware of accepting the caption of this chapter, I quote a tragic record from the history of Michigan, the end of an old trapper—one who had despised, hunted, and killed Bears unnumbered.

Edward E. Evans of Michigan writes: "Men have lost their lives when attacked by wounded bucks, but I know of but one authentic instance of an armed man being killed by a Blackbear. Bill Knight, or 'Nide,' as he was commonly called, was a famous trapper of northeastern Michigan about 1860 to the '80's. He always used a single-shot muzzle-loading rifle. His

[111] Forest & Stream, March 12, 1910, p. 416.

mangled body was found in Otsego Co., Mich., and near by a dead female Bear and a cub."[112] She surely fought for her cub.

Hibernation

Concerning the phenomena of hibernation, the most complete details and most suggestive ideas at hand are furnished by Dr. George W. Harvey, of Paradise, Calif., from whose article I quote:

"A Bear, if sufficiently fat, begins to fast some weeks before he retires to winter quarters. I have killed a number of them three and four weeks before the hibernating time, with their stomachs and intestines absolutely empty, and yet the food that they loved was abundant all about them. On the other hand, a Bear for some reason, as lack of food, disease, or old age, and poor or broken teeth, may eat up to the very day of denning, and that last meal will be found still in his stomach when he revives from his winter's sleep the next March or April. . . .

He then describes an old sick Bear, and adds:

"Out of the 26 Bears that we killed that fall and winter, this was the only one that had a full stomach after he had retired for the winter. A few had partial meals in their stomachs, but those in the pink of condition were without food in their stomachs, fecal matter in their intestines, or urine in their bladders. . . .

"That there is a continual process of fatty degeneration going on in the hibernating animal while his winter sleep endures, I am sure, and this change from the proteid or nitrogenous to adipose or carbonaceous tissue, is a physiological transmutation of these elements. Nitrogen somehow becomes [is displaced by] carbon in the Bear's economy while he is torpid, and this change of one kind of tissue into another has been proven in non-hibernating animals, as set forth in the widely celebrated experiments of Pettinkoffer and Voit."

He then shows why, according to his views, the Bear is a victim of ever-increasing auto-intoxication during the sleep.

"When he first goes into his den, his sleep is natural and he is easily aroused, as any hunter knows who has tracked one to his sleeping quarters shortly after his retirement for the winter. But undisturbed, his sleep develops into a real stupor. Respiration and circulation are the only evidences of life, and they are both retarded, to just what point I should like mightily to know. The carbon waste resulting from the change of protein tissue to that of fat is retained in the blood stream, because all the organs of elimination are locked except the lungs, and respiration is so slow that

[112] Forest & Stream, Dec., 1921, p. 554.

there is continually an excess of carbonic acid gas retained in the blood, and so long as this condition prevails, his bearship remains inebriated, or in a state of hibernation. . . .

"A certain degree of cold is necessary, I am sure, before a Bear can hibernate, but he is a warm-blooded animal always. I have seen them in their dens with the mercury 30° below zero, shivering like a Chinaman in an ague, and yet, to my touch, they were as warm as toast; but their stupor was such that I could only arouse them to the point of turning over in their nest by the most vigorous prodding with a sharp stick—'drunk as a lord.'

. . . . . .

"My star witness in the phenomenon of hibernation was a large black female Bear. I found her one day while looking for a suitable place to set a trap, as I strung out a new line for Marten, Fisher, and Fox. The snow was between 6 and 7 feet deep on the mountain where I was, and I had to look carefully for the tree cavities in which we usually set our traps."

He watched her all winter, and continues:

"I never saw her when she was not shivering in the 10 to 30 degrees below zero weather. I never saw in her, nor in any other Bear, in the depth of winter, vapour from the nostrils as in other animals in very cold weather. My Dog, Bose, who has single-handed treed dozens of Bears, and who ordinarily would wind one a mile or more never got her scent nor that of any other Bear in the den I never could arouse her to wakefulness further than to make her change her position, growl, smack her chops, and blow as only a Bear can, by the most severe prodding with a sharp stick. She was in a deep stupor exactly as a man 'dead drunk,' and the instant that I quit prodding her, she was sound asleep."[113]

The Love-moon

It is now fairly well established that the Blackbear does not mate until $3\frac{1}{2}$ years old; that is, the first young are born on the mother's fourth birthday.

The sum of evidence shows that in the latitude of the Northern States and southern Canada, the mating season is mid-June; though in some cases it may be deferred as late as the first week of July. The Akron Bears, described herein, all mated during the last ten days of June and the first week of July.

But, little is known of the details among those at large. According to some hunters, the males rush along the Bear trails, stopping at every "Bear tree" to get the latest news—there to learn what Bear has gone by,

[113] Forest & Stream, Dec., 1924, pp. 713, 748, 750, 751.

PLATE XXV.—THE BLACKBEAR: HIS UNFEROCITY

The upper shows a wild Bear, newly caught, and being led away by a Pennsylvania Game Warden. The lower shows cubs, also newly caught.
Photos supplied by the American Game Protective Association. Taken by Seth E. Gordon, Secretary of the Pennsylvania Game Commission

PLATE XXVI.— THE BEAR AND THE BOAR

whether fighting males or unmated females—add their own record, then hurry along the most promising line, to meet, perhaps, a dozen other Bears assembled in some well-known, quiet haunt, where, with much threatening and occasional combat, the sexes are paired—one male to one female. The "happy couple" set off alone on the "honeymoon" of a week or more, the female leading the way, the male following, but pausing at times to look back and hurl, if need be, a rumbling defiance to any other of his sex that seems disposed to follow or dispute his claims.

But the love-bond weakens with the love-moon's waning. So far as known, they part in July, to go their separate ways, and if by chance they meet again that year, it is as strangers, or possible enemies.

Breeding and Borning

The breeding of Blackbears was for long shrouded in mystery. It was formerly believed that Bears would not breed in captivity, but modern methods and care have disproved this. We now have very full data on the breeding of captive Blackbears, and many of the mysteries have been dispelled.

The period of gestation is about 7 months, or as M. P. Skinner maintains, $7\frac{1}{2}$ months for wild Bears.

The young are born usually in the latter half of January.

With the Akron Bears, "the young have been born between Jan. 21st and 27th, with the exception of two litters, one Feb. 1st and the other a day or two earlier. Their whimpering can be heard through the ventilating shaft, and this at once gives notice of their presence in the den."[114]

At this time, the wild mother is sealed up in her winter den, as will be seen, and, being far from torpid, very well able to devote all her time to the offspring, the case recalling that of the great Indian hornbill, in which the male bird seals up the female in the nest with the eggs, to insure her unremitting attention; only in the case of the she-Bear, the relinquishment of the world is voluntary and complete, and lasts for several months, during which she neither eats nor drinks, and is yet in full possession of some at least of her powers and faculties.

The fullest history of a breeding pair, so far as I know, is that by Arthur B. Baker. It is a nearly complete record of a pair of Blackbears from their first to their 24th year, and appears in two papers.[115]

The male was captured as a cub, in Central Michigan, July, 1888, and the female, of the same age, was taken about the same time on the south

[114] Further Notes, p. 2.

[115] A Notable Success, pp. 175–79; also Further Notes, pp. 1–4.

shore of Lake Superior. They were kept captive at T. H. Lodge's Silver Lake Park, Cuyahoga Falls, near Akron, Ohio.

The first litter was born when the parents were 4 years old; that is, the union took place when the old ones were $3\frac{1}{2}$, and this is probably the age at which normally they begin to reproduce; though it is possible that the female is ready a year earlier.

It was long stated and believed among trappers and hunters that no man ever yet killed a pregnant Bear. The fact is that the embryos are so small that no one but an expert anatomist could find them. Even up to the time when they are born, they are surprisingly small, as well as naked, and rather shapeless. They are much less in proportion than the young of any other mammal outside of the marsupials.

Reference to the Plate shows that the Blackbear has two groups of teats, two inguinal and four pectoral. It is just possible that the inguinal only are used during the den life, and the pectoral after the young are able to follow.

The Young

At birth, they are about 8 inches long, and weigh from 9 to 12 ounces, that is about $\frac{1}{200}$ to $\frac{1}{250}$ of the mother's weight, while a young Deer is $\frac{1}{30}$, a young Dog $\frac{1}{25}$, the human being $\frac{1}{20}$, and the young Porcupine $\frac{1}{15}$ of the weight of the mother. A new-born Porcupine is, in fact, as Merriam points out, actually larger and heavier than a new-born Blackbear.[116]

W. H. Wright says: "The whole litter of cubs does not weigh over a couple of pounds, and single cubs vary from 8 to 18 ounces in weight, according to the number in the litter."[117]

At this time, they are blind, and covered with a fine, close dark hair so thin that they are practically naked.

The cubs are usually 2 in number; occasionally there is but 1, especially if it be the mother's first litter; 3 are common, and 4 have been recorded several times.

Richardson says: "The number of cubs varies from 1 to 5, probably with the age of the mother, and they begin to bear long before they attain their full size."[118]

After the first brood, the Akron Bears had young "regularly, missing only 5 times in 18 years, with a total of 34 or possibly 35 cubs.

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[116] Mamm. Adir., p. 305.

[117] Black Bear, p. 70.

[118] F. B. A., I, p. 17.

"Two younger females which were allowed to breed, had their first offspring in January, 1902 and 1906."[119]

The full accounting for the original she-Bear is as follows:[120]

1892, Jan. 23. One male cub, found dead.
1893, Jan. 24. Two males and one female.
1894, —— . No cubs born, owing to young of previous year having run with mother throughout the summer.
1895, Jan. 23. One male and one female.
1896, Jan. 24. Two males and one female.
1897, —— . One male (exact date of birth not noticed, but between Jan. 21 and 27).
1898, Jan. 24. One male and one female.
1899, Jan. 27. Three males.
1900, —— . No cubs born, as young of previous year had run with the mother during the summer.
1901, Jan. 26. Two males and one female.
1902, —— . No cubs born.
1903, Jan. 21. Two males and one female.

This valuable record seems to prove, among other interesting things, that the mother Bear breeds only every other year, unless she has the misfortune to lose her family early in the season.

The following details bring the Bear history to date, and shed new light on the fecundity of the species:

"The original female, births 1892 to 1909 (no cubs 1910 to 1912), 13 litters, 34 cubs:

2 litters of 1 cub
3 " " 2 cubs
6 " " 3 "
2 " " 4 "

"Second female, births 1902 to 1912, 10 litters, 22 cubs

1 litter of 1 cub
6 litters of 2 cubs
3 " " 3 "

"Third female, births 1906 to 1911, 5 litters, 12 cubs

3 litters of 2 cubs
2 " " 3 "

[119] Further Notes, p. 1.

[120] Notable Success, pp. 175-76.

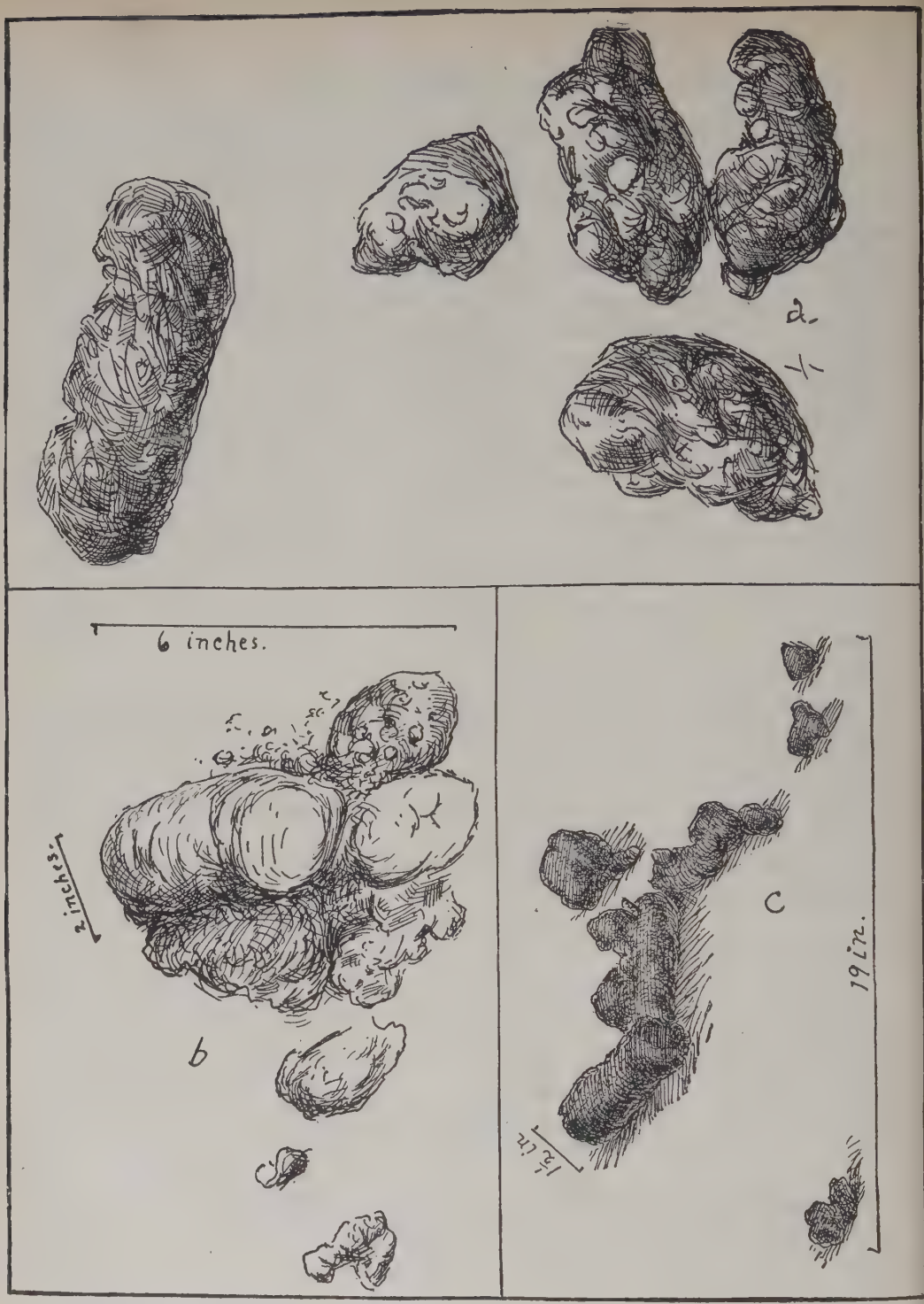

PLATE XXVII.—SCATOLOGY OF CERTAIN BEARS

a. Blackbear. Yellowstone Park, August 7, 1897 (natural size). Chiefly grass with fruit and seeds.

b. Blackbear. Athabaska River, June 15, 1907 (one third natural size). Chiefly fruit and leaves of arctostaphylos and poplar.

c. Grizzly Bear. Routt County, Colorado, September 14, 1901 (one fifth natural size). Jet black, chiefly vegetable remains, but also much fine hair that might have been from a Ground-squirrel or from the legs of a fawn. Each piece was crawling with maggots inside. The pile was many days, maybe two or three weeks, old.

"This gives 2 litters of 4 cubs, 11 of 3 cubs, 12 of 2 cubs, and 3 litters of 1 cub; but as one of these last was the first litter produced, and the male was with the female at that time, he may have destroyed one or more of the cubs. The two litters of 4 cubs were from the oldest female, and each *followed a year when she had failed to have cubs.* [Italics mine. E. T. S.]

"Record of the sexes was kept only for the first 9 litters of the original female, which included 15 males and 6 females."[121]

This makes a total of 68 or 69 descendants in 21 years from one pair of Blackbears in that menagerie, and makes no account of other possible descendants from the numerous cubs disposed of elsewhere.

Obviously, 100 descendants from one pair of Blackbear in 20 years would be well within the range of possibility, and the rate of increase according to rules of arithmetic, 2 at each birth, would make 200 not impossible.

The Den

The dens of the Akron Bears have been justified by so much success that I give in full their description:

"The original pair occupies a circular brick pit 20 feet across and 12 feet deep, which is connected by an underground passage with another similar pit, to which the Bears can be transferred when necessary. The pits are located in a dry hillside which slopes toward the east. The floor is of terra cotta blocks set in cement, so that the place can be easily washed out with a hose, and this is frequently and thoroughly done. There is also a bathing tank in the pit; and the brick-lined entrance passage, through which access to the pit is had, can be made into a separate compartment for shutting the Bears apart when desired. As more Bears were kept, additional accommodations were provided.

"An important feature of the Bears' quarters is the retiring den, which provides a suitable place for the animal to hibernate. There are two of these connected with each pit and one with the entrance passage. Each den is 5 feet by 6 feet and 4 feet high, lined with brick. They are excavated in the earth, back several feet from the pit and 8 or 10 feet below the surface of the ground. Each has a small ventilation flue extending to the top of the ground."[122]

"As cold weather approaches, large quantities of dry leaves are thrown into the pit, which the Bears carry into the dens. They spend much of their time there, but come out for an occasional meal till the advent of set-

[121] Further Notes, p. 3.

[122] Further Notes, pp. 1–2.

tled cold weather, usually about the middle of December, when they finally retire to the dens for the winter,"[123] each adult seeking a den by itself.

It is remarkable that no one yet has found two adult Blackbears in one den. Mother and half-grown cubs have been taken in the same winter quarters. W. H. Wright describes a case in point.[124] Of course, the mother with the new-born cubs is the regular thing, but never two old ones together, a fact that speaks for the unsociability of the species.

The winter denning of the Bears in the wild state was studied in the Adirondacks by Dr. C. Hart Merriam, who believes that "so long as a male Bear can find enough to eat, he will not den, be the weather never so severe."[125]

Quite in accordance with this is the fact that menagerie Bears, sure of their food, very often omit the true winter-sleep.

And yet we learn from Cory that even in Florida the Blackbear hibernates, "continuing the habit when the occasion for it no longer exists. The Florida Blackbear retires into its den early in January, and hibernates until about the first of March. That this habit is due to hereditary instinct, and not to climatic conditions or lack of food, is suggested by the fact that in southeastern Florida, the weather is warm, and the berries of the palmetto (*Serenoa serrulata*), which are a favourite food of these animals, are still very abundant at that season."[126]

A tame but free Blackbear, kept on the Red River by Alexander Henry in 1804, began to prepare its winter den as early as November 13th.[127]

I have seen one or two Bear dens, and have heard many described by the hunters. They vary from a deep, snug, sheltered natural cave in the rocks, to a hollow tree or a hole under an upturned root. Sometimes the Bear digs a den in the level ground, as I once saw in Manitoba, and sometimes it makes a bed under a windfall of logs and brush, or in a dense thicket. But wherever chosen, it is sure to be a dry place where the snow will gather and lie deep all winter.

Nevertheless, it seems that the Bear does not truly torpify in hibernation.

On Leaving the Winter Den

Countless Bears have been seen and slain in their winter dens, yet I know of but two men who have had the good luck to see an old Bear at the

[123] Further Notes, p. 2.

[124] Black Bear, p. 82.

[125] Mamm. Adir., p. 97.

[126] Mamm. of Ill. & Wis., 1912, pp. 396–97.

[127] Journ., p. 253.

time when first it emerged in the spring. The first was Bert A. Dobson, my Adirondack guide.

It was in mid-April of 1906; he and his partner were log driving on Fish Creek, Lewis Co., N. Y. As they sat on the bank waiting for the drive, an enormous Blackbear appeared on the opposite side of the stream. It gazed stupidly at them, sniffed, walked to the water, within 30 yards of the loggers, and drank long and greedily, so long that its front legs seemed tired of stooping. Presently, it straightened up, sniffed, gazed, and again drank heavily. Three times it did this, till it seemed distended with water. Then it crossed the stream, still sniffing and gazing in a dazed fashion, and walked past the men. They noticed that it was an enormous Bear and that its cheeks were grizzled.

After it was gone, they followed its back track in the snow, and 250 yards away came to a small pine tree that was deeply scored by the teeth of a Bear at 5 or 6 feet from the ground. Pieces had been torn out recently, and to such an extent that the trunk was nearly cut through. On following the trail 100 yards farther, it led to an enormous hollow pine tree, and there ended. This proved to be the winter den. Evidently they had seen the Bear taking its first drink.

The second observer was M. P. Skinner, who saw a Blackbear come out March 26, 1923. This was in the Yellowstone Park. His account confirms that of Dobson.[128]

As already noted, the Bear comes out of his den as fat seemingly as when he went in. We have learned that he drinks copiously, but apparently he is in no hurry to eat.

Concerning the Akron Bears at their spring appearance, Baker writes: "The Bears have always come out . . . in practically as good condition as they went in, not even the females with cubs a month old or more showing any thinness. Nor do they appear to be hungry, for at the first meal they take but very little food, putting out the tongue and touching the apple, parsnip, or whatever food is offered, before biting it; and it is only after 3 or 4 days, or even a week, that they eat with the usual appetite."[129]

In all cases, the mother has hovered and brooded over the young for 6 or 8 weeks, covering them as anxiously as though a single breath of cold air would be their certain and sudden death, as doubtless it might, under their natural conditions in certain parts of the range.

A litter of young Blackbears was born in the Brooklyn Zoo in 1899,

[128] Bears in Yellowstone, p. 105.

[129] Further Notes, p. 2.

and the keeper, Edward Walsh, wrote: "The mother seems to spend most of her time suckling them, and is very solicitous for their comfort. The cubs have a habit of whining like puppy Dogs, especially when by any chance they are crowded away from their dinner. Their mother licks them and fondles them with her paws, and is as proud of them and jealous of interference as any human mother."[130]

Frank J. Thompson, whose account of the Blackbears bred in the Cincinnati Zoo, is the earliest that I know of, gives the following interesting details of their development: "In about 10 days, their coats began to show, and were of a grayish tint, which gradually passed through the various shades until they became a brownish-black. It was just 40 days before the first one's eyes opened, and 2 days later, the second followed suit. From that time forward, I watched very closely to ascertain the exact time that would elapse before the young ones would leave the nest, and on the 71st day after birth, when the mother, as was her habit, came to the grating to be fed, one of the youngsters left the nest and followed her. As soon as she found it out, she immediately drew it gently back, and, on its second attempt, *she cuffed it soundly*, which put a stop to its wandering propensity.

"After a few days, she allowed them to wander about at will, provided no one was immediately in front of the den, but as soon as a visitor put in an appearance, they were driven back into the nest and not allowed to emerge until the strangers were out of sight. For some time, she always suckled them in one position, lying over and completely covering them by stretching flat on her belly with her legs drawn up under her and her head tucked down between her front paws. As they grew older and began to run about, she would sit on her haunches, lazily lean back against the wall, take a cub on each forearm, and hold them up to her breast until they were satisfied. . . .

Occasionally they would have a regular sparring bout, standing erect, feinting, countering, and making use of many of the tricks of old votaries of the prize-ring. These frolics would generally end in a clinch fall, and a regular rough-and-tumble fight, when the mother would abruptly put a stop to it by suddenly knocking both of the contestants completely out of time. In fact, as they grew apace, the parental visitations increased so rapidly, I began to fear she would put an end to my Bear investigations by chastising the lives out of them."[131]

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[130] Forest & Stream, Feb. 4, 1899, p. 84.

[131] Forest & Stream, Sept. 4, 1879, p. 605.

Seeing the World with Mother

My old hunting pal of Manitoba days, George H. Measham of Winnipeg, sends me the following in a personal letter, March 11, 1925: "I was on a lonely fishing trip following the Pearl River, a little stream that flows into Superior about 60 miles east of Port Arthur. . . .

"Presently I heard a dry twig crack, and other sounds that told me that some large animal was approaching the river about 50 feet below where I reclined.

"In a few seconds a large Blackbear, accompanied by a single cub, appeared on the shingle bar that edged the pool below me. They took a drink, and I suppose I moved. At any rate, Mrs. Bruin spotted me. She said something to her youngster that sounded like '*Ou-rough*,' and made for the woods in double quick time. I, in the meantime, had sat up to see the show. The cub had probably never seen a human before, and he sat up and crossed his paws. He was panting with the heat, and expressed his unfeigned admiration by letting his little red tongue loll out. I have rarely seen anything so comical.

"But the mutual admiration society of myself and the cub were brought to an abrupt conclusion. Mrs. Bruin, missing young hopeful, came back for him in a hurry. Splashing through the shallow water, she gave vent to some very pointed remarks on the subject of obedience, and emphasized them with a cuff on the ear that sent young hopeful head over heels. By the time he was on his feet, she was again hidden in the woods, and he followed with all speed. It was a most interesting demonstration of parental care and parental authority."

This determination to bring the young up right, no matter how much spanking is needed, is common to most mother Bears, but is very variable individually. I have known an old Bear to punish her young one severely merely because she, herself, had at that time lost her head in a sudden alarm and behaved foolishly. We look not in vain among our own kind for parallel cases.

Springtime

When spring comes with force in the woods, it melts the snow and Trees the icebound mother Bear. If the weather is at all settled, and the ground partly clear of snow, she sets forth on her travels in search of food, the little ones stringing behind her like a lot of little Pigs. And now they say goodbye to the old den. Thenceforth the mother sleeps where and whensoever she is sleepy; and the little ones slumber, cuddled in her arms, more or less beneath her body.

The old Bear usually comes out fat in the spring, but the scarcity of food and the drain of the thriving young family soon reduce her stored-up supplies. A May Bear is always a lean Bear, though an April Bear is nearly always a fat one.

The cubs learn to eat solid food as soon as the bare ground makes it obtainable.

A picture of their earliest coming forth is furnished by William H. Wright, the well-known authority on Bears, in his book, "The Black Bear." He says:

"When some two miles from camp, he [O'Brien, his hunting partner] had heard, above the constant splash of falling snow, the crying of some animals, and as the sound seemed to be coming nearer and nearer, he had crouched down behind a large log and, holding his Dog in check, had waited and watched. Shortly, out from among the trees, there appeared a large Blackbear, followed by 3 tiny cubs, the whole family having evidently just left their winter quarters. It must have been an amusing procession, for the old Bear was ploughing her way through the soft and slushy snow, making large holes into which the baby Bears would fall, and out of which, being so small, they were scarcely able to flounder. They were quite unable, therefore, to keep the pace set by their mother, and the old Bear would slouch along for a while, and then sit down and watch them as they struggled to catch up. And all the time they kept up the whimpering, crying sound that had attracted Jack's attention."

The man shot the mother, but the cubs escaped up a tree. Next morning, the men returned.

"The carcass of the dead Bear lay about 50 feet from a huge fir tree, and we soon saw the 3 cubs huddled together and sitting on the body of their dead mother."[132]

The gambols of a family of little Bears are exceedingly boylike and amusing. They wrestle and box and pretend to fight with all the vigour of gamins at play. Usually they are careful to keep the rules of the game and avoid hurting each other, but ill-tempered Bears are as frequent as ill-tempered boys, and savage quarrels have thus arisen in the family.

A. B. Baker tells of a little reprobate which, when only $3\frac{1}{2}$ months old, killed his brother in a fight over a pan of milk. They certainly were brothers. This same authority has further given us in context the seamy side of the mother's character, as related later.[133]

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[132] Black Bear, pp. 5–8.

[133] Notable Success, p. 177.

The Mother's Care

The mother's care of them, and their faith in her at this time are ideal, and all pictures of it that have been put on record have a human character that is sometimes exceedingly touching. Whenever any sudden and serious danger appears, the mother in some way sends the youngsters scrambling up the nearest tree. There they will stay for hours till she comes back to call them down.

This I witnessed several times in the Yellowstone Park, near Old Faithful Hotel, during the day when I lived among the Bears. One mother chased her two cubs up a tree at my approach, while she investigated. They stayed there long enough for me to make a sketch. Then, at her bidding, they slid down, and disappeared with her into the woods.

The other mother, the one that was called "Grumpy," had but one cub, the ill-favoured and unhappy little wretch called "Johnny." Several times, on the approach of possible danger, she sent Johnny up the nearest tree. Usually he came down when the coast was clear; in any case, watched for some sort of hint from his mother.

On one occasion, the menacing enemy was a huge Grizzly. Then, to my surprise, old Grumpy actually grappled with him. There was some heavy fighting, with clinching and foul blows for a few seconds, but Grumpy was clearly getting the worst of it. She was indeed much smaller than her foe. She saved herself at last by dashing away, and up the tree at the top of which was little Johnny, venting his trepidation in wailings, long and loud.

As noted later, I saw a similar episode on the Salt River of Alberta.

Jerky Johnson of Southern California once caught a yearling Blackbear in a trap. It bawled so that he heard it in camp a mile away. He went at once with his Dogs. They found the Bear in the brush. It bawled louder than ever. Suddenly, a big Cinnamon Bear appeared and fought off the Dogs.

This was the only time that he knows of one Bear coming to help another in trouble. It may have been the mother that came.[134]

Throughout the summer, the old Bear wanders about the home region that she knows—probably less than a 10-mile radius—and the little ones grow in size, but usually dwindle in numbers. Accidents will happen, and little Bears get coughs and colds, or disobey their mothers and come to grief. Consequently, while 3 little Bears are often found in the mother's den, rarely more than 2 are seen roaming by her side in summer; and autumn, in many cases, sees the number reduced to 1.

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[134] Told me by James M. Mackenzie, of Bakersfield, Calif.. Oct. 6, 1899.

The young, whatever the number, are weaned in August, and yet are believed to den up with the mother the following winter, and probably remain with her until the mating season comes with their second June. Finally, however, the family feeling is dispelled by the newer thought. The young ones scatter, and thenceforth, when they meet the mother, they are little better than any other strangers.

Abnormal Mothers

Mother Bears are like some other mothers—kind and devoted as a rule. But the inevitable exceptions occur, for like all living beings, no two are alike, and Bears that are cowardly or worse have more than once been seen.

According to L. F. Kuntsch, of Malone, N. Y., a father and two sons who were gum-hunters went into the Adirondacks to gather the spruce gum in the summer of 1901. When near Mt. Haystack on their return journey, they walked unexpectedly into a full-grown she-Bear. The men were practically unarmed. "The Bear uttered a short, low growl and showed her teeth. It was soon seen why she made no threatening move toward them. Just behind her were her two cubs.

"At a signal from the father, the party crept quickly but quietly out of sight of the Bear, and the sons were hurriedly sent home for the rifles. That the Bear would leave her cubs did not occur to them. Hence it was with the greatest surprise they saw on returning to the stump, that the mother was nowhere to be seen. The cubs were left alone. Such a thing had never occurred to the woodsmen before. With the greatest caution, they stole up to where the cubs lay, and hurriedly snatched them up, expecting every moment the old Bear to charge them. But after waiting fully an hour, and seeing no trace of her, they turned toward home."[135]

The mother of the Akron Bears, already described, "is a model mother to the cubs as long as they remain under her care, even refusing on their account the attentions of her mate; but when they are taken away, her affection for them seems soon to end. The two cubs of 1898 were removed in May and returned to the mother early in October, after first being kept for two weeks with only a grating between. She had seemed to recognize them, but when they were put together, she at once caught the little male by the head and killed him, and only forcible measures prevented her from climbing the tree and repeating the operation on the other cub, which had taken refuge there."[136]

These are the criminal, or perhaps the thoughtless, among Bears.

[135] Recreation, Sept., 1901, p. 204.

[136] Notable Success, p. 177.

The Massacre of a Family

On the 14th of June, 1907, I was camped on Salt River, northern Alberta, with Major Jarvis and an Indian half-breed named Sousi Beaulieu, who met with a Bear family whose finish is thus recorded in my Journal of the time:

"We had not been long in camp, when Sousi went off to get some water, but at once came running back, shouting excitedly, 'My rifle, my rifle!' Jarvis handed it to him; he rushed off to the woods. I followed in time to see him shoot an old Bear and two cubs out of a tree. She fell, sobbing like a human being, 'Oh! Oh! Oh-h-h-h!' It was too late to stop him, and he finished her as she lay helpless. The little ones were too small to live alone, so shared her fate.

"It seems, as Sousi went to the water hole, he came on the old Bear and her two cubs. She gave a warning 'koff, koff.' The only enemies they knew about and feared, were Buffalo, Moose, and Wolves; from these a tree was a safe haven. The cubs scrambled up a tall poplar, then the mother followed. Sousi came shouting in apparent fear; I rushed to the place, thinking he was attacked by something, perhaps a Buffalo bull; but too late to stop the tragedy that followed.

"That night he roasted one of the cubs, and as I watched the old cannibal chewing the hands off that little baby Bear it gave me a feeling of disgust for all flesh-eating that lasted for days. Major Jarvis felt much as I did, and old Sousi had exclusive joy in his Bear meat."

The Unfatherly Father

So far as I can determine, the father Bear takes no interest in the young ones.

Baker says of the Akron Bears: "The male was twice allowed to be with the family for a short time in April, and did not injure the cubs, though he carried one about, taking nearly the whole cub into his mouth."[137]

Menagerie keepers have learned, through many disastrous experiences, that the less the sire is with the cubs, the better for them. In the vast majority of cases, the mother is the only adult seen abroad with the young.

His Way of Life

Which one of us that has seen a Blackbear rolling, tumbling, fooling, and tomfooling in the Zoo, can fail to see in this animated Teddy-bear the frolicsome clown of the woods that he really is?

[137] Further Notes, p. 3.

His first cage-impulse is, of course, to seek food, and this he manifests by restlessly pacing up and down. But once his hunger is satisfied (and it takes not a little to fill his vast and expanding maw), he is ready, after a brief nap, to play, to show, indeed, what his real nature is, when not under the urge of hunger, fear, or sex hanker.

With his mate in the cage he will wrestle by the hour, grinning and uttering a peculiar "hoo-hoo," which surely is a Bear laugh. Tumbling around with back-holds, half-nelsons, grip-locks, hip-throws, under-snatches, mat-hugs, close-grips, shoulder-heaves, overthrows, foul and fair, he shows an amount of suppleness, quickness, and ponderous brawn that would fill a Jap wrestler with envy of brilliant emerald hue.

Good-nature and strength are the outstanding features of these bouts. And when, at length, one of the tumblers has had enough, he signifies the same by running off or climbing up the center post of the den.

Most keepers of animals who are thoughtful about the amusements of their charges—and all successful ones are of this kind—provide apparatus and playthings that give mental as well as physical exercise. The Blackbear is usually provided with a big wooden ball, as well as trees and climbing places. Some Bears invent games to play with the ball. Many times I have seen a Blackbear lie on his broad fat back with all four feet in the air, twirling a big wooden ball with marvellous adroitness.

A most surprising development of this trick is recorded by W. H. Wright. His big tame Bear, Ben, was in the habit of tusselling and romping with some boys. But one day, in the excitement of the sham battle, the Bear forgot his strength, and, sprawling on his back, twirled one of the boys, ball-fashion, on all four paws. The boy was badly scared, and a good deal hurt by the rough game. Steps were taken to prevent Ben again indulging in this sport with a live ball.[138]

Forgetting for the moment the sad, bad Bear that is found once in a thousand, the Blackbear is a big, fat Happy Hooligan, the happy-go-lucky, eternally good-natured merry-maker of the woods. His career, so far as it has been seen by human eyes or mapped by human fingers, is a succession of odd and amusing adventures, outside of the time he goes, perforce, to seeking needed food.

One of the most charming and true pictures of Bear life that I can find is from the facile pen of J. O. Curwood. Writing of the Blackbear, and moved with indignation that this superb and harmless creature should be classed as vermin, he says:

"I have been having an experience with a species of vermin which I

[138] Black Bear, p. 48.

love. The baby vermin of this particular species are, to me, almost as lovable, and quite as cute in their ways, as human babies; and for the adult vermin, the mothers and fathers of the babies, I have a far greater love and respect than I have for many males and females of my own breed. And, taking it all round, they are a cleaner, handsomer, and more wholesome-looking lot than the average crowd of humans, though they are—because of the mightiness of man's edict—nothing more than vermin.

"I am speaking of Bears. A few years ago, one of my most thrilling sports was to hunt them—Blacks, Grizzlies, and Polars. Now I consider them, in a way, my brothers, and I am having a lot of fun in the comradeship. I am filled with resentment when I consider that in all the States of this country, with the exception of two or three, the law says these friends of mine are 'vermin,' along with lice and fleas and maggots, and that they may be killed on sight, babies and all, because—perhaps once in his lifetime—a Bear living very close to civilization may make a meal off pig or lamb. If every human mother in the land could hold a baby cub in her arms for five minutes, there would be such an uprising of feminine sympathy that the laws would be repealed."[139]

His Playfulness in the Wilds

Notwithstanding his usual solitary life, the Blackbear is very playful, and at times is successful in finding a playmate.

Enos A. Mills tells us concerning one with which he had made friends by frozen stillness, friendly emanations, and low, soft talking: "As I had kept up a lively, pleasant conversation all this time, he evidently concluded that I was friendly, and, like a boy, proceeded to show off. Near by stood a barrel upright, with the top missing. Into this the Bear leaped, and then deliberately overturned it on the steep slope. Away downhill rolled the barrel at a lively pace with the Bear inside. Thrusting out his fore paws, he guided the course of the barrel, and controlled its speed."[140]

And again: "Twice I have seen a Blackbear, 'the Happy Hooligan of the Woods,' and a Coyote playing together. . . . Once I saw a Blackbear try repeatedly to get a stupid, lumbering Porcupine to play with him. All the way across an opening he made efforts to start a game, but dull Porky lumbered on indifferently. The Porcupine is the only animal that I have known which I have never seen play."[141]

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[139] God's Country, James Oliver Curwood. Izaak Walton League Monthly, June, 1923, p. 534.

[140] Watched, pp. 100–01.

[141] Adv. Nature Guide, pp. 204–05.

A Bear Sociable

There is a possible, but wholly unrecorded, chapter to be added to this. It should deal with the social life and amusements of the Blackbear. Has it any? I have heard old hunters tell that in the days when Bears were plentiful and less afraid, it was common to find in some one place a score of Bears of both sexes. They were not fighting, they were not mating, they were not feeding. Yet they were moving about in a limited space. At least they were getting acquainted. Some say they were measuring their height against trees and otherwise showing off.

One old hunter told me that the Bears would sit around in a rude circle. One big fellow would march up to another, saying, "Woof, woof, woof," then rear up against the nearest tree, and mark the height reached by his nose tip. After this, the second Bear tried to beat it, etc., etc., etc.

There was no obvious reason for meeting at this place; but all the trees near by, and on the Bear trails approaching, were torn with teeth and claws of the Bears there assembled.

I can find no good testimony to establish the idea. Wright, in his admirable monograph of the "Black Bear," does not mention it. It may be without foundation, but is in the line of many precedents among other animals, so should be looked for with open mind.

The Bear and the Clock

An amusing incident is related by Thomas H. Fraser, a sporting fisherman who was enjoying his summer in Nova Scotia, on the upper waters of the Stewiacke, in a June of the '90's. Determined to be astir for the earliest fishing of the day, he set an alarm clock for 4 A. M., but was so eager that he was wide awake long before that time.

Early in the dim dawning, he heard a heavy footfall round his cabin. The door was pushed open, and, to his horror, in came a big Blackbear.

"The intruder acted as if he were at home, and the now trembling creature up in the bunk sincerely wished that he were. I cuddled down in the bunk as flat as possible, keeping a single eye above its edge to watch the visitor in fascination.

. . . . . .

"Turning about now, he saw what in all probability had first lured him into the cabin—my sack containing bacon, bread, and cheese. This, fastened to a wire hook, to be out of the way of Mice and Woodrats during the night, hung to within some 6 feet of the floor. On this discovery, he rose on his hind feet and found he could just touch the bag with the extreme

points of his claws, and vainly tried with blow after blow to dislodge the tempting bait, while the sack swung like a pendulum to and fro. . . . While seemingly contemplating the swinging sack, his ear caught the ticking of the little clock. The sack no longer interested him, and he shuffled over to the table where the little time-piece was still insistently striving to attract attention and to entertain.

"'Well, now,' he seemed to say to himself, 'what curious little animal is this?' And he tipped his head sideways, and cocked his ear toward the sound.

"For what seemed to me a long, long time he remained intent upon the object of his curiosity—watching it with a curiously expressive grin, and seemingly charmed by its rhythmic tick-a-tock, until, just as I was beginning to hope that he might discover its use and learn that it was time to leave, the alarm went off with a roar that to my then state of nerves was like the continued crash of musketry. I expected then to see the marauder smash the clock to fragments with a blow of his great paw. But he did nothing of the kind. For the hundredth part of a moment, he seemed stunned, and the muscles of his countenance wrinkled into expressive fear; and then, with a terrific snort, he whirled and bolted for the door. Over went the bench and water-bucket, and a small cupboard, filled with pots and pans, came tumbling down, and as he dashed through the door it closed against his side, and was burst from its hinges." He crashed into the tamarack swamp and disappeared.[142]

The Kindly Clown

A wonderfully appealing and yet accurate account of a Blackbear's life and growth is to be found in W. Lyman Underwood's "Wild Brother." In this, he details the history of a cub that was taken from its mother's den in the winter woods of Maine and reared and nursed by a sympathetic woman along with her own baby. The Bear was named Bruno and the girl Ursula. Those who wish to follow in detail the close observations on Bruno's development and mentality, will enjoy reading this nature story.[143]

It is only one of the many testimonies to the gentleness and unferocity of the Blackbear. A thousand cases I can find which show him to be a rollicking, hilarious, clownish creature; with occasional outbursts of stupid violence that look like treachery, especially in captive Bears, which are notoriously unsafe. But the wild Bear is fat and good-natured and woefully timid, asking only to be let alone.

[142] Forest & Stream, Dec. 24, 1910, pp. 1010–11.

[143] Atlantic Monthly Press, Boston, Mass.

One case only can I find in which a wild Bear unprovokedly attacked and slew a man. What answer can we find for the riddle thus presented? The same as in our own species: the thousand show the type of the race, the odd case shows the freak, the reprobate, the murderous degenerate; and these, of course, should be destroyed whenever discovered. But the normal Blackbear should be fostered as a beautiful and desirable denizen of our woodlands.

His life is in the far, silent places, he shuns and fears man, and harms neither him nor his interests, except in the once-in-a-million case, which does not prove anything or count in the fair appraisal.

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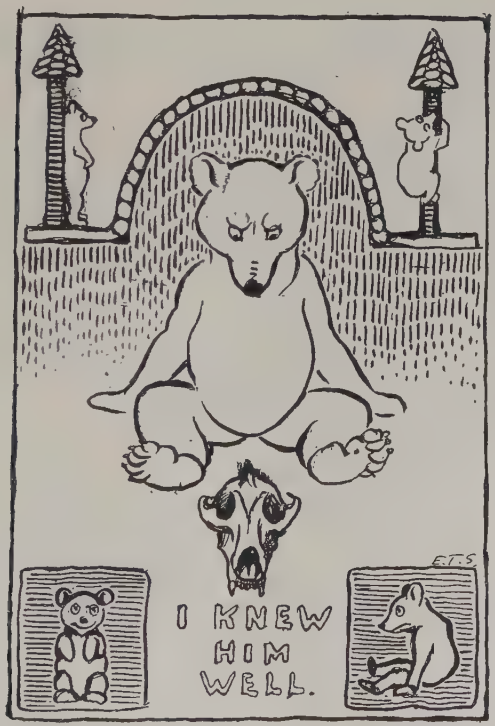

Inland White Bear, or Kermode's Bear

Ursus kermodei Hornaday

(Named in honour of Francis Kermode, Curator of the Provincial Museum at Victoria, B. C.)

Ursus kermodei Hornaday, 1905, 9th Ann. Rep. N. Y. Zool. Soc., Jan. 10, pp. 80–86.

Type Locality—Gribble Island, Western British Columbia, Lat. 53° 25′, Long. 129° W.

It is quite possible that Kermode's Bear may be an albino of the Blackbear. The white freak, however, is very rare; I can find but two cases on record, as already noted.

In teeth, and all important details of anatomy, this Bear seems to correspond exactly with the Blackbear group. Exact measurements are not available, since the type specimen was a flat skin.

The following is from the original description of the species:

Size. "This is a Bear of small size, much below the dimensions and weight of the average Blackbear (*Ursus americanus*).

"Judging by Bears that have been weighed and measured in the New York Zoological Park, this animal, when alive, must have been about 27 in. in shoulder height, and its weight about 200 lbs.

"In general appearance, its skin is like that of a long-furred and particularly handsome Polar Bear.

Colour. "Its colour is clear, creamy white, with no trace of brown, black, or any other dark colour. In the type specimen, on the upper neck and head, and on the fore legs, the yellowish creamy tint is well defined. The hair is all white, down to the roots; and on the entire animal there is not one brown or black hair.

"The claws are dull white, thin, and strongly curved, representing about 120° of a perfect circle, $1\frac{7}{8}$ in. in diameter for the middle front claw."

The eyes are brown.

History, etc.

"In November, 1900, while making an examination of the skins of North American Bears that were to be found in Victoria, B. C., the writer

found a very strange specimen in possession of Mr. J. Boskowitz, a dealer in raw furs. The skin was of a creamy white colour and very small. Mr. Boskowitz reported that it had come to him from the Nass River country, and that he had previously received four or five similar skins from the same locality.

. . . . . .

"Four years have elapsed without the appearance of a zoological collector in the region drained by the Nass and Skeena rivers, and further evidence regarding the White Bear of British Columbia was slow in coming. At last, however, the efforts of Mr. Francis Kermode, Curator of the Provincial Museum at Victoria, have been crowned with success, in the form of three skins in a good state of preservation. They represent two localities about 40 miles apart. The four specimens now in hand, are supplemented by the statements of reliable persons regarding other White Bear skins which have been handled or seen by them, and were known to have come from the same region.

. . . . . .

"A Mr. Cunningham, who is a reliable trader and storekeeper at Port Essington, at the mouth of the Skeena River, stated to Mr. Kermode that every year he gets some White Bear skins, in trade, and that they have come to him 'only from the district south of the Skeena River, and have been taken as far south as Rivers Inlet. The most of them, however, have come from Kitimat Arm, which is just north of Gribble Island, about Lat. 54°.'

"The man who shot the type specimen (No. 1), has stated that he knows of 18 other White Bears having been taken in the region which furnished the type.

"Apparently the only reasons why this interesting ursine form has so long remained unnoticed are that no scientific collector has visited its locality, and the skins that have been taken have drifted into the fur trade and quickly disappeared. No doubt, they have been universally regarded, outside of British Columbia, as skins of young Polar Bears."[1]

In the spring of 1924, some Indians, hunting on Princess Royal Island, ran across a mother White Bear and two cubs. The cubs, true to their racial tradition, scrambled up a tree. The mother was driven off, one of the cubs was secured, and, after many adventures, chiefly political, found a resting place in the Zoo at Beacon Hill Park, Victoria, B. C., where it abides to this day. The photograph shown was loaned me by Francis Kermode, after whom the Bear was named.

[1] W. T. Hornaday, as above cited.

This specimen, I am told, has brown eyes, and although everywhere white, is not apparently an albinism.

R. M. Anderson writes me that an Indian friend of his told him that White Bears were found on the headwaters of the Liard River. Also that one of his correspondents killed a white cub that was following a black mother. The cub was not an albino. This was in the Skeena country.

The range is shown on the Blackbear map.

According to the official reports on the fur production of Canada, in the season of 1921–22, British Columbia contributed 11 White Bears; the following year, 1, and the next 0. There can be little doubt that all of these were *kermodei*. None have been taken lately because the Government has declared an absolutely close period.

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Polar Bear, White Bear, Sea-bear, Water-bear, Greenland Bear, Ice-bear, Ice-king, Ice-tiger, Brownie, Nahnook

Thalarctos maritimus (Phipps)

(Gr. *Thalassa*, sea; *arktos*, Bear; L. *maritimus*, of the sea)

Ursus maritimus Phipps, 1774, Voyage Toward North Pole, p. 185.
Thalarctos maritimus Gray, 1862, Catal. Bones Mamm. Brit. Mus., p. 105.

TYPE LOCALITY—Spitzbergen

FRENCH, *L'ours blanc.*
ESKIMO, *Nu-nu-ok*, *Nanook*, or *Nahnook.*
DANISH, *Björn.*

"On account of its light creamy colour, rarely pure white, except when young, the Scotch whalers call it the 'Brounie' or 'Brownie,' and sometimes the 'Farmer,' from its very agricultural appearance as it stalks leisurely over the furrowed fields of ice."[1]

The Genus *Thalarctos* Gray, to which this belongs, is composed of large Bears, which have the cheek-teeth much less robust than those of *Ursus;* the canine and incisors, enlarged; and whose colour is uniform white or yellowish white; whose fur is dense and oily, and nearly covers the soles of the feet. The Polar Bear is the only member of the genus.

In addition to the generic characters, the Polar Bear has the following:

Total length, 7 to 8 ft. (2,135 mm. to 2,438 mm.); tail, $3\frac{1}{2}$ to 5 in. (90 mm. to 127 mm.); hind foot, about $14\frac{1}{2}$ in. (368 mm.); height at shoulders, 3 to 4 ft. (914 mm. to 1,220 mm. .

Weight, ♂'s about 900 lbs.; ♀'s about 700 lbs.

Various weights on record. 610 lbs.[2] In A. Fisher's Voyage, 1821, he tells of a large ♂ Bear, taken 11 July, 1819, which was sick, its alimentary canal in a high state of gangrene; it weighed only 895 lbs. Another killed the year before was 1,095 lbs. (pp. 45–46). A very large one taken by Ross, weighed $1,131\frac{1}{2}$ lbs. after loss of blood;[3] another, 1,028 lbs.[4]

[1] Brown, Mamm. Green., p. 344.

[2] Phipps, Voy. N. Pole, 1774, p. 185.

[3] First Voy., App., p. 150.

[4] Second Voy., App., p. VIII.

In Hudson Strait, July, 1821, Capt. Geo. F. Lyon killed an unusually large ♂ Polar Bear. "On hoisting him in, we were astonished to find that his weight exceeded 1,600 lbs."[5]

This last is the heaviest actual weight on record and may be accepted as the maximum. Hunters' guesses of "over 2,000 lbs." need not be taken seriously.

The average of 9 ♂'s taken at Lancaster Sound by Capt. Jas. C. Ross, in 1830, was: Total length, 94 in. (2,370 mm.); weight 900 lbs.

Average of 7 ♀'s taken by Ross at the same time and place: Total length 78.7 in. (2,000 mm.); weight 700 lbs.

The largest of these was 101½ in. (2,563 mm.) in length, and weighed 1,028 lbs., although in poor condition.[6]

Colour. The fur of the Polar Bear is everywhere of a yellowish white; nearly pure white in the very young, and often brownish white in adults during summer. The eyes, nose, and pads show as blackish spots on the fur.

Races

Knottnerus-Meyer has recently (1908) described six races of Polar Bear, four of which are found in America. However, the describer gives no external characteristics for these sub-species, and his skull characters are too minute and elusive for any profitable presentation here. The ranges ascribed interlock and overlap in a surprising manner.

Range

In brief, the range of the White Bear is every part of the truly Arctic Sea in the Old World as well as the New; and a little way, but very little, on to the adjoining land.

The map is founded chiefly on the following: Nelson's "Natural History of Alaska" for the West; D. T. Hanbury, E. A. Preble, and R. M. Anderson for the Arctic Coast of Canada and the Hudson Bay; R. M. Bell for Labrador; Rasmussen for Greenland; T. Pennant for Iceland; in addition to which, all the standard works of Polar travel have been consulted, especially those listed here as reference works. The map has been revised by the Biological Survey.

The following records are worthy of full entry:

"As the Arctic ice closes the sea north of Bering Straits in October and November, large numbers of Polar Bears are brought down on the floating

[5] Priv. Journ., p. 10.

[6] Second Voy., App., p. VIII.

pack, and pass through the straits with the ice, and reach Saint Lawrence and Saint Matthew Islands, where they are numerous all winter. During severe winters, when the pack ice extends farther south than usual, a single specimen sometimes reaches the Fur Seal Islands, but this is rare. On such seasons they reach the mainland coast of the Territory south to the Yukon mouth; although they are extremely rare on the coast south of the straits.

"In the summer of 1880, a half-grown young Polar Bear was killed near Saint Michael's in August, a very unusual occurrence; none had been killed there for many years.

. . . . . .

"There is no record of the White Bear on the Aleutian Islands. . . . and, except on Saint Lawrence and Saint Matthew Islands, they are virtually unknown south of Bering Straits in summer."[7]

Mr. H. Dall says that, according to the whalers, St. Matthew is so full of White Bears that they call it Bear Island. It is at the southern limit of floating ice.[8]

"The Polar Bear is found at different seasons in all parts of Hudson's Bay, even to the southern extremity of James Bay, having been seen on two occasions at Moose Factory. The Captain of one of the Hudson's Bay Company's ships informed me that he killed a large specimen, swimming in the open water, far from any ice, midway across the bay. . . .

"In the spring, they come down the Labrador coast with the ice, and are occasionally killed off the northern parts of Newfoundland."[9]

"At one time, by no means uncommon on the island, but since the extensive seal-fishery has been carried on by schooners among the drift-ice in the Straits of Belle Isle, and elsewhere round the coast, the Polar Bear has become very rare—nearly, if not quite, extinct."[10]

"By accident, wafted from Greenland, on islands of ice, to Iceland and Newfoundland."[11]

"We have occasional visits from the Polar Bear."[12]

G. F. Wright reached Cape Charles Harbor on the Labrador coast at the east end of the Strait of Belle Isle, on 17 July, 1894. Here, one of the

[7] Alaska, pp., 254–55.

[8] Alaska and Its Resources, 1870, p. 249.

[9] Bell, H. B. & Lab., p. 50 DD.

[10] Henry Reeks, Notes on the Zoology of Newfoundland, the *Zoologist*, London, March, 1897, pp. 20, 40–41.

[11] Arc. Zool., I, p. 54.

[12] Jas. Howley, Personal letter, Newfoundland, 28 Nov., 1906.

first objects which arrested his attention "was the magnificent skin of a Polar Bear which had been killed the previous season on the land near by."[13]

Prof. John Macoun told me long ago that a few Polar Bears were to be found every year, and all summer long, on Charlton Island, which is in James Bay, 65 miles northeast of Moose Factory. That is, the White Bear is to be found regularly even now within 500 miles of Ottawa.

"A few years ago, one penetrated as far inland as Ft. McPherson—over 100 miles—robbing meat caches and playing havoc among Dogs."[14]

These records fix its southern range. Its Northern limit is not so sure, but it seems to be circumpolar as far north at least as there is land. In E. A. Preble's "Mammals of Athabaska-Mackenzie Region"[15] he gives records which spot all the Islands of the Arctic Sea to the Prince Patrick Island and North Devon Island. It has apparently been found in higher latitudes than any other quadruped, having been seen by Capt. W. Ed. Parry in his 1827 boat-voyage at 82° 30′ of north latitude."[16]

Greely found the Polar Bear occasional in Grant Land.[17]

R. E. Peary found the species at Cape Chalon in 1895. This is on the east side of Smith Sound, lat. 78°.[18] Also near Cape Columbia, the northmost point of Grant Land in 1919.[19]

According to Dr. Henry Rink,[20] the Polar Bear is "found everywhere" in Greenland; that is, on the shore line. Capt. William Scoresby speaks of seeing about 100 Bears on the coast of Greenland.[21]

R. Brown says : "The well-known 'Polar' or 'Ice Bear' is found along the whole coast of Greenland from north to south."[22]

Dr. T. Wulff says: "The Polar Bear seem to be very rare on the north coast [of Greenland]; only at rare intervals were its tracks found, and a newly killed young Seal by Dragon Point, was assumed to have fallen a victim to it."[23]

So far as known, the female does not den up in the Labrador Region,

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[13]Greenland Icefields, 1896, p. 13.

[14]F. Russell, Explo. Far North, 1898, p. 245.

[15]N. A. F., No. 27, pp. 226–27.

[16]Narrative, App. Nat. Hist., p. 190, 1828.

[17]Three Years Arctic Service.

[18]Northward Over the Great Ice, Vol. II, p. 433.

[19]The North Pole, p. 146.

[20]Dan. Green., p. 104.

[21]Arc. Reg., p. 110.

[22]Mamm. Green., p. 344.

[23]Rasmussen's Greenland, 1922, p. 299.

or along the north coast of the Canada mainland. Therefore, these are outside its native region.

Haunts and Migration

The chosen home of the Polar Bear is among the broken ice offshore. It rather shuns the land. Very rarely does it roam as far as 20 or 30 miles from the sea, the source of its food. The record already given of a Polar Bear at Fort McPherson, 100 miles inland, is unique; and yet less strange than it seems, for Fort McPherson is on the Mackenzie delta, which at least looks like an arm of the sea.

The Ice-king is much more ready to go a-swimming far to seaward than exploring landward; and records there are in abundance of White Bears swimming in the open sea, out of sight of land.

Hearne says: "I have frequently seen and killed those animals near 12 leagues from the land; but as the fall of the year advances, they are taught by instinct to seek the shore."[24]

"They swim boldly far out to sea," says Nelson, "and while the *Corwin* lay at anchor off the ice during a heavy gale in August, 1881, a Bear came swimming off to us in the face of the sleet and wind. He had probably smelled our smoke, and came off to reconnoitre; but a warm reception changed his mind, and he turned and vanished in the fog again."[25]

As already noted, a Bear has been seen swimming in the middle of James Bay; that is 70 or 80 miles from land.

He occasionally visits Iceland, which implies an oversea journey of at least 100 miles.

Capt. F. L. McClintock says: "It seems hardly right to call Polar Bears *land* animals; they abound here—110 geographical miles from the nearest land, upon very loose broken-up ice, which is steadily drifting into the Atlantic at the rate of 12 or 14 miles daily." He was then in Baffin's Bay.[26]

Finally Scoresby adds: "He is as much at home on the ice as on the land, and is found on field-ice above 200 miles from shore.[27]

In the North, there are three conditions prohibitory to the White Bear: unbroken land, unbroken water, and unbroken ice. Granting a reasonable minglement of these three, he can thrive and be happy, for his

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[24] Journey, p. 368.

[25] Alaska, p. 255.

[26] Voy. Fox, 1860, p. 92.

[27] Arc. Reg., pp. 169–70.

food comes chiefly from Mother Sea. He can catch it there, and needs only a solid perch for resting, sleeping, eating, and breeding.

This implies that in the Arctic winter, when the Polar Sea is a solid sheet of ice, all the Bears are driven south to its edges, or to channels that are kept open by the tides.

Thus there is a distinct migration of Bears, with the coming of winter; that of the males and barren females, far out seaward to the edge of the ice, and that of the pregnant females, inland, to den up and sleep.

Senses and Powers

It will be noted that, concerning each and every animal treated in this work, it has been said and truly said: "Its sense of smell is very acute." But this seems especially—yes, marvellously—true of the Polar Bear.

We know that a Fox can scent and seek out a covey of quail, perhaps 100 yards away. A Wolf can smell a wounded Deer, maybe a quarter of a mile distant. A Deer will scent a hunter a mile off down the wind at times, but a Polar Bear seems actually to scent and locate a feasting chance at a distance of from 10 to 20 miles.

Rink says: "Wherever the carcass of a Whale may be found, or a rich hunt of Seals or White Whales occurs in a certain place within these confines, there several Bears are sure soon to make their appearance.[28]

Brown tells us of 20 Bears gathered at one dead Whale.[29] It is not to be supposed that these 20 were within a mile or two when the Whale body was stranded. They were surely drawn by the odour from many miles away. Yet it does not do to assume that the Whale was rotten and frightfully strong. Such a condition does not arrive in that icy country. The simple explanation is, in the words of Scoresby:

"His senses are extremely acute, especially his sight and smell. As he traverses extensive fields of ice, he mounts the hummocks and looks for prey, and on rearing his head and sniffing the breeze, he can perceive the scent of the carrion of the Whale at an immense distance.[30]

"His power of smelling is very great," says O'Reilly, "and the sailors take advantage of this faculty to entice him within their reach, by burning a herring, the smell of which never fails to attract the animal."[31]

The same explorer credits the great Bear with keen sight. This gift

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[28] Dan. Green., p. 106.

[29] Mamm. Green., p. 344.

[30] Arc. Reg., p. 169.

[31] Greenland, p. 103.

is rare among his near kin. But especially useful to him, dwelling in an open country, where there is unbroken day for four or five months each year.

Snowblindness is common among humans who continuously face the glare of sun on snow. There may be, therefore, some interesting scientific facts behind this statement by O'Reilly: the Bear's eye is "covered with a nictitant membrane, similar to that with which the eyes of birds are provided. This membrane is highly useful to the animal, by sheathing his eye, and protecting the sight from the strong glare of the snow."[32] We have already seen that the Grizzly-bear suffers from the same.

Hearing. There is no reason to credit the White Bear with acute hearing. The smallness of the visible ears, as well as the smaller occasion for relying on this sense, leads us to believe that, like the Antelope, the Mountain Sheep, and other dwellers in the wide open spaces, his eyes and nose are his main advisers, so that his ears have dwindled for lack of use.

Speed. Those of us who know the Polar Bear only as a huge, hulking captive in the Zoo, can have no adequate notion of the speed with which it can travel or the quickness with which it can leap and dodge, when occasion demands. On land or level ice, its speed is far beyond that of the swiftest man. On rough ice or among rocks, the Bear is at still greater advantage.

Swimming. But it is in the water that its special gifts are best seen. Scoresby estimates its ordinary swimming speed at 3 miles an hour;[33] and Brown says: "I have chased it with a picked crew of 8 whalemen, and yet the Bear managed to distance us in the race for the icefields."[34]

This implies a speed of at least 4 or 5 miles an hour, and, as in this case the swimmer was a she-Bear encumbered with the care of 2 little cubs, we may believe that, for a short spurt, the Bear can go at the rate of 6 miles an hour. Further, it is attested by many that the White Bear in the water can make a sudden plunge forward which amounts to a leap of 10 or 15 feet.

An unexpected peril of his realm is thus set briefly forth by Rae: The current on Frozen Strait is strong "with the flow and ebb of the tide—so strong is it that when Bears are pursued and take the water, they are often swept under the ice and drowned."[35]

The remarkable photographs and many pictures taken by Capt. F. E. Kleinschmidt show that, in swimming, the Polar Bear propels himself almost entirely with the front limbs, exactly as do the penguin and

[32] Greenland, p. 103.

[33] Arc. Reg., p. 170.

[34] Mamm. Green., p. 344.

[35] Exped. Arc. Sea in 1846–47, London, 1850, p. 175.

probably most Seals. The hind feet are held straight out and are idle in ordinary forward movement.

As a diver, the Bear is very expert; but details of depth and distance are not at hand.

His Flesh

There is wide difference of opinion as to the wholesomeness of Bear meat. Nelson says that "the flesh of the Bears we killed in Alaskan waters was tough and rank."[36] But the flesh of those killed by Elliot and Maynard on Bering Islands was pronounced very good eating, perhaps owing to their food being mainly vegetable matter at this time, and so rendering the meat less rank than usual.[37]

Hearne, with wide experience says: "The flesh of this animal, when killed in winter (if not too old), is far from being unpleasant eating; and the young cubs in the spring are rather delicate than otherwise."[38]

In like strain, Scoresby: "The flesh, when cleared of the fat, is well flavoured and savoury, especially the muscular part of the ham. I once treated my surgeon with a dinner of Bear's ham, and he did not know for a month afterwards but that it was beefsteak. The liver is very unwholesome."[39]

The extreme condemnation is by Brown, who says: "The flesh and especially the liver, is said to often prove poisonous when eaten. The Eskimo on the western shores of Davis's Strait carefully prohibit their Dogs from devouring any portion of it."[40]

Ross says his party, "tempted by the fine appearance of the [Bear] meat, made a hearty meal off the first one that was shot. All that partook of it soon after complained of a violent headache, which, with some, continued 2 or 3 days, and was followed by the skin peeling off the face, hands, and arms; and in some, who had probably partaken more largely, off the whole body.

"On a former occasion, I witnessed a somewhat similar occurrence, when, on Sir Edward Parry's Polar Journey, having lived for several days wholly on two Bears that were shot, the skin peeled off the feet, legs, and arms of many of the party. It was then attributed rather to the *quantity* than the *quality* of the meat, and to our having been for some time previous on very

[36] Alaska, p. 255.

[37] As above, p. 254.

[38] Journey, p. 368.

[39] Arc. Reg., p. 171.

[40] Mamm. Green., p. 334

short allowance of provisions. The Eskimo eat its flesh without experiencing any such inconvenience; but the liver is always given to the Dogs, and that may possibly be the noxious part."[41]

Richardson tells us that in 1596, Barentzoon led an expedition to Novaya Zemlya. Here his men, in straits for food, took the liver of a Bear "and drest and eate it; the taste liked us well, but it made us all sicke, specially 3 that were exceeding sicke, we verily thought that we should have lost them, for all their skins came off, from the foote to the head; but yet they recovered againe, for which we give God heartie thankes."[42]

Last, Dr. E. K. Kane, best equipped of all, perhaps, to treat the subject says: "Oct. 8, [1854,] when I was out in the *Advance* with Capt. De Haven, I satisfied myself that it was a vulgar prejudice to regard the liver of the Bear as poisonous. I ate of it freely myself, and succeeded in making it a favorite dish with the mess. But I find to my cost, that it may sometimes be more savoury than safe. The cub's liver was my supper last night, and to-day I have the symptoms of poison in full measure—vertigo, diarrhœa, and their concomitants.

"I may mention, in connection with the fact which I have given from my Journal, that I repeated the experience several times afterward, and sometimes, but not always, with the same result. I remember once, near the Great Glacier, all our party sickened after feeding on the liver of a Bear that we had killed, and a few weeks afterward, when we were tempted into a similar indulgence, we were forced to undergo the same penance. The animal in both cases was old and fat. The Dogs ate to repletion, without injury."[43]

His Royal Robe

From 30 to 100 White Bear skins are sent each year from Greenland to London,[44] and from the Hudson's Bay Company 83 in 1891,[45] 170 in 1902, and 96 in 1903.[46] That is, about 150 skins each year are sent from the American Polar regions. This seems to show that the animal is common, as the skins are not sought after by the traders.

The famous old traveller Hearne always has some interesting remarks to offer on whatever he sees, and concerning Nahnook's coat, he says:

[41] Second Voy., App., pp. VII–VIII.

[42] Polar Regions, 1861, p. 71.

[43] Arc. Explor., I, pp. 392–93.

[44] H. Poland, Fur-bearing Animals, p. 159.

[45] As above, p. 159.

[46] Macfarlane, Mackenzie Basin, 1908, p. 226.

"To dress one of those greasy skins in Winter, as soon as taken from the beast, it is stretched out on a smooth patch of snow, and there flaked down, where it soon freezes as hard as a board: while in that state, the women scrape off all the fat, till they come to the very roots of the hair. It is sometimes permitted to remain in that position for a considerable time; and when taken from the snow, is hung up in the open air. The more intense the frost, the greater is its drying quality; and by being wafted about by the wind, with a little scraping, it in time becomes perfectly supple, and both pelt and hair beautifully white."[47]

At Cape Farewell, according to Brown, "a curious custom prevails, viz., that whosoever sights the Bear first, man, woman, or child, is entitled to the skin, and the person who has shot it, only to the blubber and flesh."[48]

It is a wonderful robe. The travellers of the Far North often use it fur side in, for a sleeping bag, but it is worthy of a more honourable position and service. Its vast size and unbroken breadth of deep, golden-white fur make it a royal prize—a favourite floor-rug for the palaces of the great, and sought by priests in the North as a carpet in front of the cathedral altar.

Numbers

Every sealer, whaler, and Polar explorer who has spent a season within the range of the species as here mapped, has seen a few White Bears.

Scoresby, writing in 1823, says: "Bears occur in Spitzbergen, Nova Zembla, Greenland, and other Arctic countries, throughout the year. In some places, they are met with in great numbers. By means of the ice, they often effect a landing on Iceland, but as soon as they appear, they are generally attacked by the inhabitants and destroyed. On the east coast of Greenland, they have appeared like flocks of Sheep on a common."[49]

On approaching the coast of Greenland on his 1808 voyage, Scoresby saw about 100 Bears.[50]

Capt. J. C. Ross, after having been in several polar expeditions, says (1833) that they are found in greater numbers in Prince Regent Inlet (between Cockburn Land and North Somerset) than in any other part of the Polar Region with which he was acquainted.[51]

R. Brown says: "The well-known 'Polar' or 'Ice Bear' is found along

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[47] Journey, p. 367.

[48] Mamm. Green., p. 344.

[49] Arc. Reg., p. 170.

[50] Nor. Whale Fish., 1823, p. 110.

[51] 2d Voy., App., p. VII.

the whole coast of Greenland from north to south, but not nearly so numerous as in former times, or as is popularly supposed. There are more in the northern than in the southern portion of the country; and it is very seldom seen in mid-Greenland, i. e., between about 69° and 66° N. Lat. There are yearly killed from 30 to 60 of them. Occasionally, there are a number killed near Cape Farewell, which have come round on the annual ice-drift."[52]

Dr. Henry Rink says that upward of 50 are shot yearly on the coast of Greenland, about half of them near Disco and half near Cape Farewell.[53]

"During the Sealing-season, both in Greenland and in the Spitzbergen seas, the Bear is a constant attendant on the sealer for the sake of the carcasses, in the pursuit of which it is sometimes 'more free than welcome.' I have often also seen it feeding on Whales of differing species, which are found floating dead. In 1861, I saw upwards of 20, all busily devouring the huge inflated carcass of a *Balaena mysticetus* in Pond's Bay, on the western shore of Davis's Strait."[54]

Jas. Lamont tells of upward of 50 Bears gathered to feast on the bodies of a herd of Walrus killed by ivory-hunters on Spitzbergen in 1854.[55]

Speaking of the species in Bering Sea, Nelson says: "In spring, the Bears keep along the border of the pack ice, and with it, pass north through the Straits and into the Arctic Ocean. Every season, however, large numbers of these animals remain on Saint Matthew Island, where they appear to be permanent residents, as they are, to a much smaller extent, on Saint Lawrence Island.

"During the summer of 1874, Mr. W. H. Elliott and Lieutenant Maynard found these Bears extraordinarily common on Saint Matthews, where Mr. Elliott estimates that there were *several hundred* at the time of their visit in August. This island is only about 22 miles long, and is very narrow. It is essentially Arctic in its flora, the lowlands being covered with small flowering plants, grasses, and mosses, while the hills and ridges are bare and rocky. As their boat approached Hall's Island, just off Saint Matthews, 16 of these Bears were seen, 10 of which were on the beach together. The party from the vessel killed 15 to 20 Bears, and were satisfied to leave the others undisturbed.

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[52] Mamm. Green., p. 344.

[53] Dan. Green., p. 106.

[54] Mamm. Green., p. 344.

[55] Seasons with the Seahorses, 1859, p. 94.

"In July and August, 1881, while the *Corwin* was cruising among the ice near Wrangel and Herald Islands, we saw a considerable number of these animals and killed several of them."[56]

For centuries, it has been the custom of Arctic travellers to kill all Polar Bears they could. It did not matter whether the Bears were a menace, or whether the travellers needed the carcasses or not. In recent years, this senseless slaughter increased, since more travellers went north, and deadlier weapons were carried. One Arctic explorer told me that he personally had killed 200 Polar Bears, and secured but few of them.

The Canadian Government determined to stop this wicked destruction, yet sought for a good reason to offer the public. The naturalists supplied it: Every Polar Bear is followed all winter by a retinue of White Foxes, who live on the scraps of his table. Without him, they would die. Therefore, the Polar Bear is conserving a valuable fur supply. So the law was passed; to-day, the Polar Bear is protected as a high-class game animal.

His Way of Life

The great, long six-months day—the nightless day—is on the chilly islands of the Polar Sea. The day that dawned in mid-March to rule unbroken until mid-September is beaming on the cold, pale green expanse.

In the narrow strip 'twixt icy sea and icy cap that covers the uplands, are the bright, brave Arctic plants, making what hay they may in this, their little span of life. For now is springtime, heatherbell-time, and love-time.

There is much mystery about this romantic chapter of the White Bear's story. Lyon's Eskimo told him that May was Nahnook's merry month; others make it June. Hearne thought it as late as July or even August. The analogy of other Bears would make it late June. But so much is sure: it is in this long polar day, this season brief of flowers hedged round with ice, that Nahnook goes a-roaming—a-seeking for a mate.

Who can tell us of his mind and heart, in this the climax of his life? Stories we have in abundance of his hunger and his carnage, but never a word of his softer moods. How does he let his needs be known, that he and some lady-Bear like-minded, may cross each other's path at this very time. The Elk goes bugling through the hills in loud announcement; the Beaver advertises at every corner of his highways, in castorized mudpies whose informational smell is part of a secret code. The mateless Marten puts little signboards on the trees—small musky messages that inform the world that, thus and so, he needs.

[56] Alaska, pp. 254–255.

But the Ice-king—what of his way? Is his appeal to eye, or ear, or nose, when the mating May-time thrills his world, and sends him gallivanting? Does he anoint the angle stones on the headlands with his body-scent? Does he gallop at random? Does he sing some loud, heroic song like a Lion roar? Or does he follow every trail that his discriminating nose announces as a she-Bear's trail?—till he find her. And if so be, there arrive at that trail's end together two great King-bears of the ice, what then? A mortal combat, a finish fight, or a meek submission to the lady's judgment?

Of all this, we know nothing. It is recorded only that the mating is in midsummer. The Eskimo and Northern Indians say that this mating is a pairing. Polygamy has seemingly died out in the upper classes of the beasts.

How long do the pair stay together? Some of the hunters say only for a month. Yet Hearne found them associating in July and August. And we have many cases in the Zoo of the two living happily together the year round.

Here is a puzzle on which we get light only from analogy: the young come out of the winter den with the mother, in late March, and stay with her all summer. Yet no one has recorded the young with the mother during the mating moon; and there is some evidence that the prospective stepfather would resent their presence.

The known habits of the Blackbear and the partly known habits of the Grizzly lead us to believe that the Polar Bear breeds only every other year, unless perhaps the young are destroyed. Normally, therefore, every other summer is given to raising the cubs, which leave the mother in their first autumn. They are now two thirds grown and about 10 months old.

The mother Bear is not pregnant this year, and therefore she does not of necessity hibernate. She wanders freely and alone all winter, until springtime comes, when once again she takes unto herself a mate. There is no sufficient reason to suppose that this is the same mate as in other years; but it is likely that the pair continue attached to each other during the mating time. On Sept. 10, 1819, Capt. John Ross killed two Bears apparently associated, and therefore most likely a pair.[57]

As we have seen, Hearne thinks that the period of courtship, though little known, may continue as late as "July or August, for at those times, have often been at the killing them, when the males were so attached to their mistresses, that after the female was killed, the male would put his

[57] First Voy., App., p. 150.

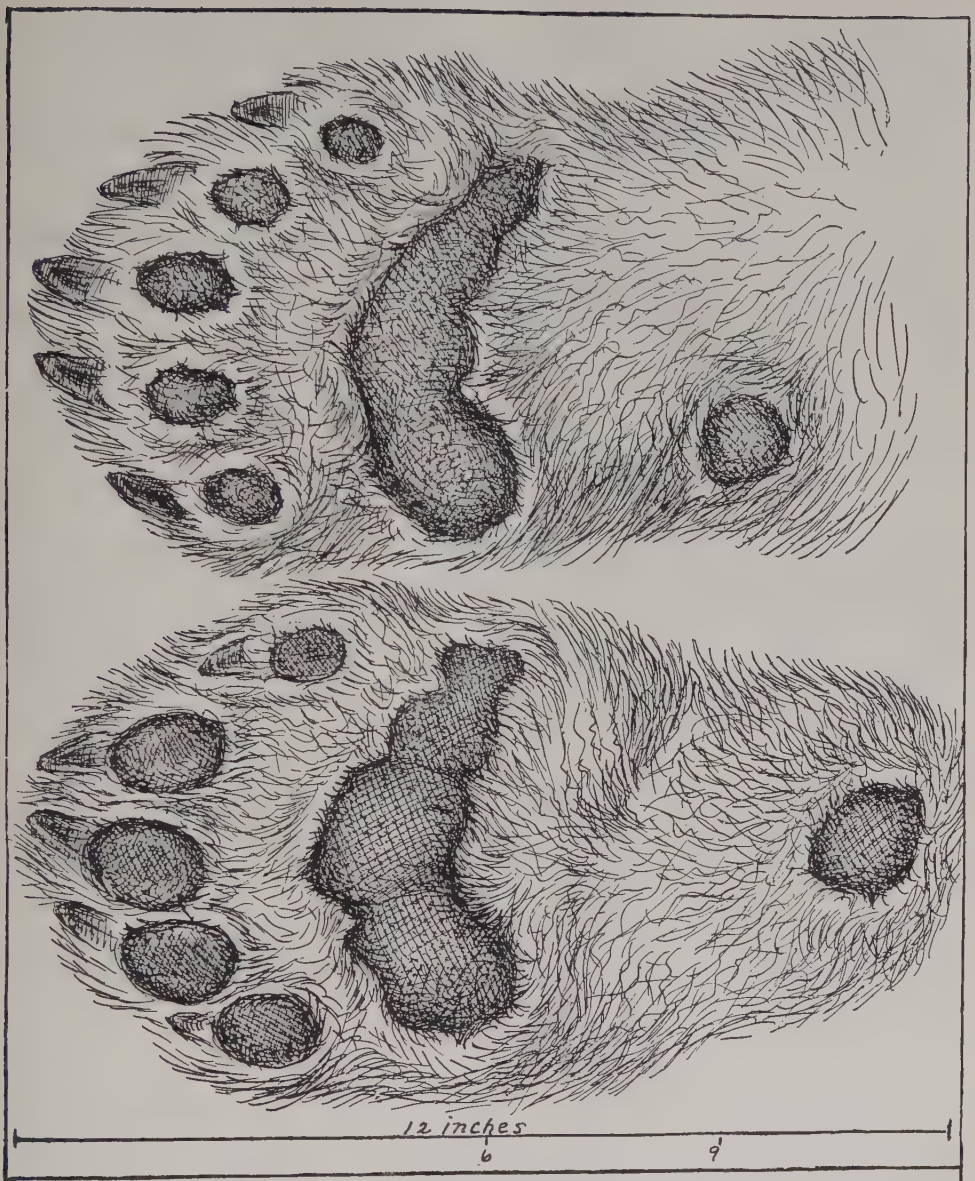

Plate XXXI. Polar Bear ♂ – Paws of Right side.
from dry skin No. 2885 American Museum.
by E. T. Seton 1925

two fore paws over, and suffer himself to be shot before he would quit her."[58]

At other times, it is rare to see two full-grown Bears together; and when we do, it is usually the accident of a food supply that assembled them.

The He-Bear's Way

The mating bond, then, is apparently dissolved in July, or in August at latest. Nelson writes me that, on or about the 1st of Aug., 1881, he found male, female, and yearling cub associated, as described hereinafter. But this is unusual. The pair now drift far apart. After this time, no he-Bear is seen with a she-one. Though there were hundreds of Bears on the Bering Sea Islands, Aug., 1881, according to Nelson, the males were by themselves.[59]

When the dark days of autumn come, the he-Bear wanders off alone among the marshes and parts adjacent to the open water. But at snow-time, far from the land he hies him, away to the very sea. The edge of the ice is his most rewarding hunting ground, and his favourite game is the Seal. Not in the water, for there the Seals can mock at him, and often do. They will skim about a swimming Bear and tease him, as small birds do a hawk; but when the fat pinniped is hauled up on the ice, asleep or resting, the tables may be turned. He is ever alert, but Nahnook is an expert hunter and stalker.

McClintock says, on securing a big Bear in Baffin's Bay during the April of 1858, "I remarked that the upper part of both Bruin's fore paws were rubbed quite bare; Petersen [the Eskimo] explains that to surprise the Seal, a Bear crouches down with his fore paws doubled underneath, and pushes himself noiselessly forward with his hinder legs, until within a few yards, when he springs upon the unsuspecting victim, whether in the water or upon the ice."[60]

The Mother and the Young

The male Bear turns to the sea in search of food; the female turns to the land, for a wholly different reason. Mother Carey has served notice on her that another duty is impending. She must even now make preparations for her coming brood, though that coming is yet far ahead. At this time she is alone—the pregnant female is always solitary.[61]

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[58] Journey, p. 368.

[59] Alaska, p. 254.

[60] Voy., Fox, 1860, p. 93.

[61] Lyon, Priv. Journ., p. 273.

The hunting has been good, and the huntress exceedingly active and alert, so that her ribs are well coated with fat, her bones and muscular frame are soaked with fat, her belly is a mass of fat and life-machinery mixed. Indeed, it may be said that all Bears are fat when winter comes.

She quits the moving ice and the unbroken shore ice and makes for solid land, with instinct as unerring as that which sent her he-Bear to the floes. Here in some sheltered nook on the high, dry land, with screening banks or rocks about, she digs a den—not in the earth, for that is hard as stone now—but into the drifts of snow, which in such places are many feet deep.

Down, down as far as she can get. Then curling up, she sleeps; while the ever-driving wind piles up the snow again about her and tamps it hard as ice. Always, as Thos. Hutchins says,[62] there is in the snow-dome over the den a small hole to admit fresh air.

It was winter, hard and dark, when she retired; that means November or early December. Here, dull, drowsy, and without food, she lies, nor ventures forth. About Christmas, according to Thos. Hutchins, or according to others about the end of January, the cubs are born. They are nearly always 2 in number.

As with all Bears, these are very small at birth, not much bigger than Rats; and are nearly naked or covered only with a fine down.

The Mother has nothing to do but love them; and this task, she assumes with her whole heart, strength, and being. Her chief milk-teats are on her breast; and between her arms she licks and fondles the cubs and enjoys their nursing, with little pause, until winter is well on the wane.

The heat of her body and her restless moving about have enlarged the icy den, until it now offers ample room for the two growing cubs, as well as herself. By a special provision of nature, her bowels have been as torpid as her life, and no evacuations have taken place; so that the den is not defiled.

These caged-in months are not without their perils. That little vent hole in their roof-dome maintains a scent connection with the outer world; and the Eskimo, with their hunger-driven Dogs, are keen to find and follow such a lead. Captain Lyon's old Eskimo, Ooyarrakhioo, described the occasion thus:[63] "The natives find and kill the Bears during their confinement by means of Dogs, which scent them through the snow, and begin scratching and howling very eagerly. As it would be unsafe to make a

[62]Mss.

[63]Priv. Journ., p. 274.

large opening, a long trench is cut, of sufficient width to enable a man to look down, and see where the Bear's head lies; and he then selects a mortal part into which he thrusts his spear. The old one being killed, the hole is broken open, and the young cubs may be taken out by the hand; as, having tasted no blood, and never having been at liberty, they are then very harmless and quiet."

But this tragic nipping of their early lives comes not often on the race. The majority escape this, practically the only peril of that period.

Late in March, with the sun once more above the horizon, the warm winds thin the ice-walls of the den. The mother, reduced with nursing, and hungry now, is able to break out and lead her offspring into the open air, the open world, and, maybe too, the open sea.

The Raising of the Cubs

The cubs were no bigger than Rats at the time of birth, but they have grown not a little, at mother's expense, and are now as big as Rabbits, or even Arctic Foxes. They leave a track no bigger than "a crown piece," as Hearne says (though, for our understanding, he should have said a "silver dollar"), while that of the mother "measured near 15 inches long and 9 inches broad."[64]

Their winter den may have been 20 or even 30 miles inland; but as soon as the springtime comes, with opening waters, light, and active life renewed, Mamma Nahnook turns her sagacious nose with absolute infallibility toward the unbound heaving sea, and leads her twins to the real source of food; realizing, doubtless, like some of our rulers, that sea-power must in the end prevail. Now, those adventurers, man or beast, who value life and health, will in no wise cross her path or seem in any form to menace the two snow-white teddy-Bears that toddle at her side. There is no limit to her courage and unselfishness in their defense. There seems no limit to her power and endurance when it is for those four-legged mischief-making snowballs. Every one of the numerous Arctic explorers that met the Polar Bear at home have testified to the tireless, whole-souled love and devotion of the mother to her young.

"If perchance her offspring are tired," says Hutchins, "they ascend the back of the dam, where they ride secure either in water or ashore."[65]

"If a female, and accompanied by her young," says O'Reilly, "she will

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[64] Journey, p. 368.

[65] Ms.

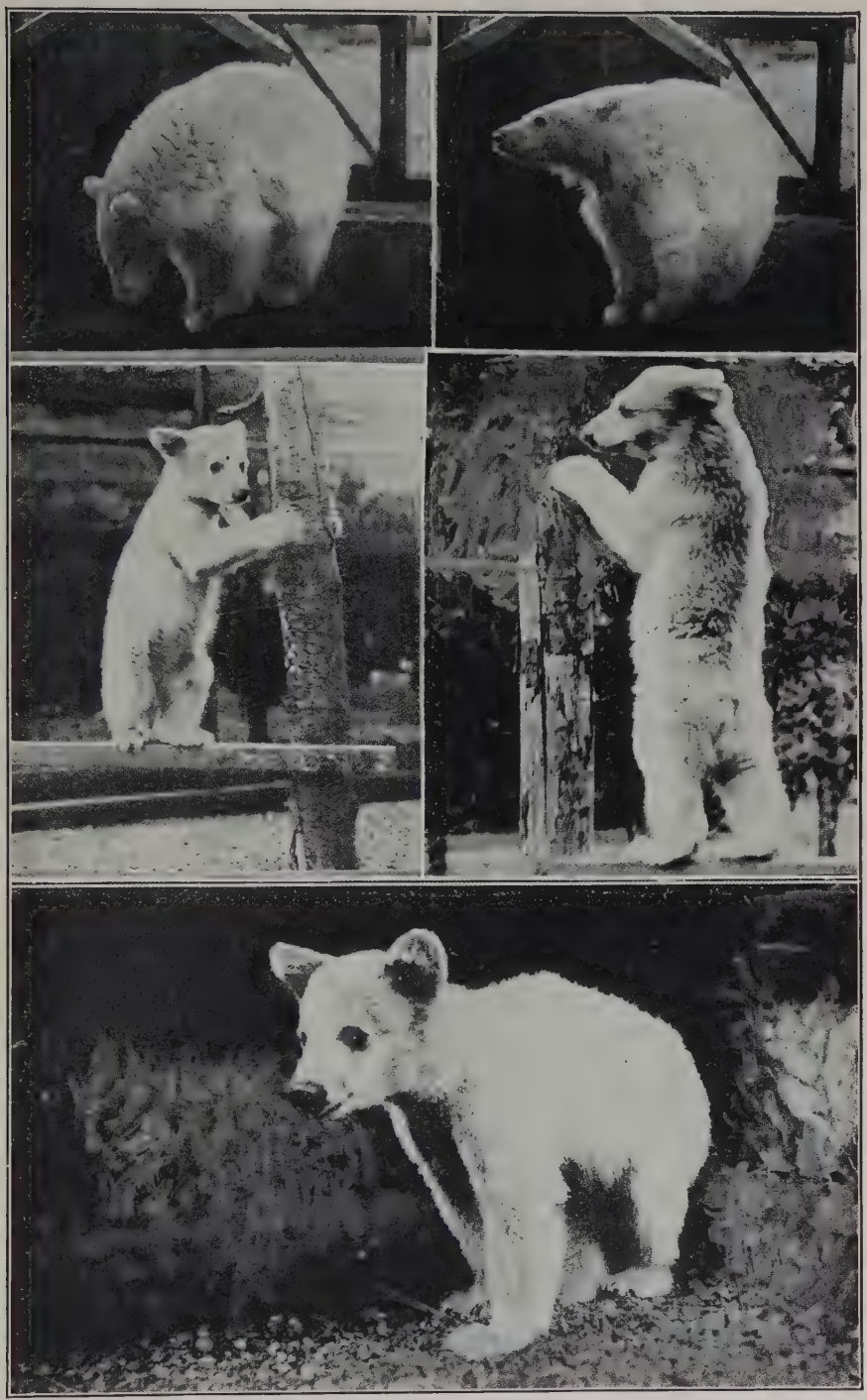

PLATE XXVIII.—KERMODE'S BEAR. THE SAME INDIVIDUAL AT DIFFERENT AGES

From photographs by Francis Kermode and Thomas W. S. Parsons

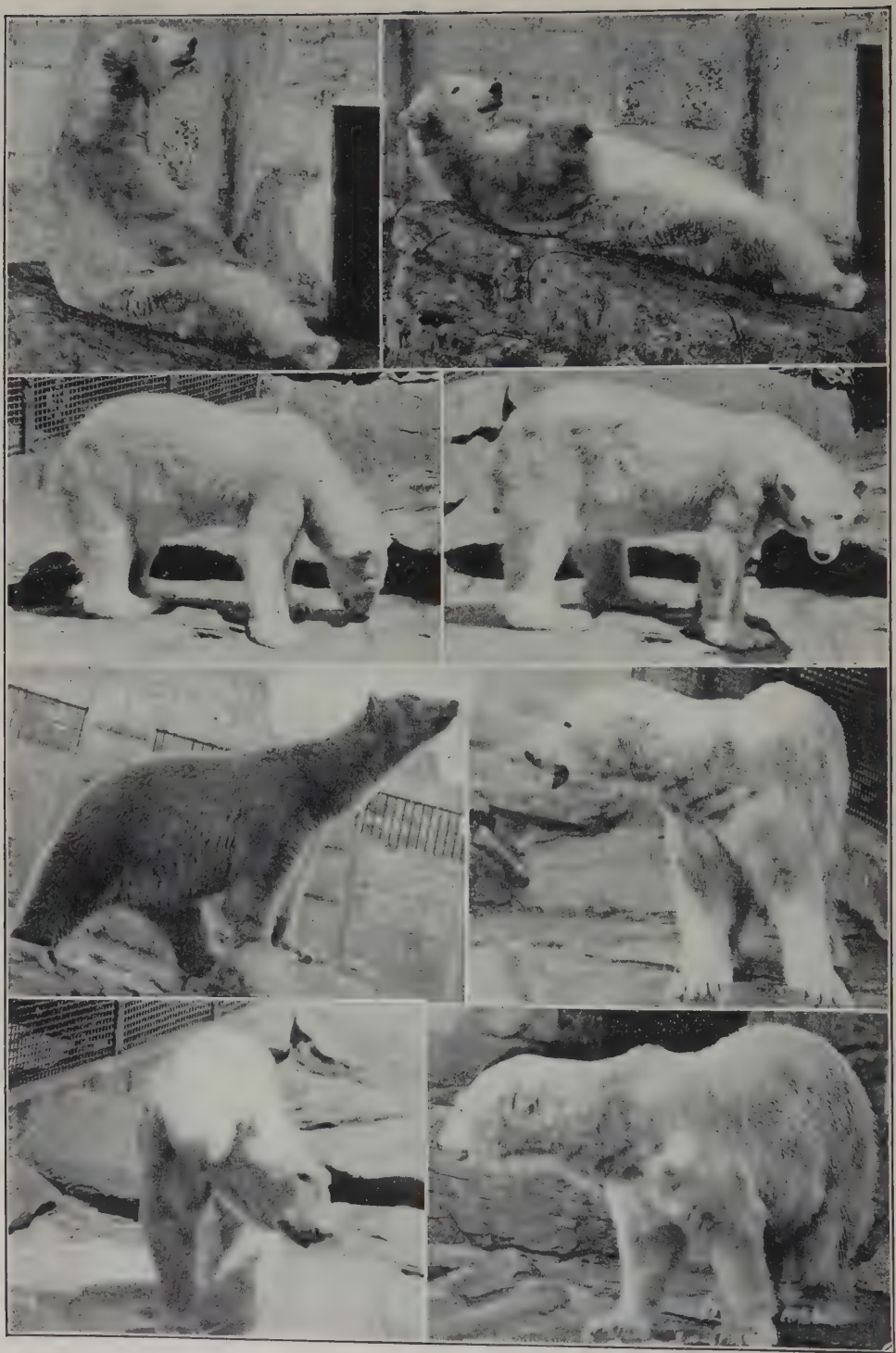

PLATE XXIX.—POLAR BEARS, NO. I

never forsake them, though ever so badly wounded; but, unmindful of her own safety, will use every exertion for the preservation of her cubs."[66]

Says Scoresby: "Bears are remarkably affectionate towards their young, and peculiarly sagacious. . . . On one occasion, a mother Bear with two cubs was pursued across a field of ice by a party of armed sailors. At first, she urged her young ones to increase their speed, but finding the pursuers gaining on them, she carried or pushed or pitched them alternately forward, until she effected their escape. The little creatures are said to have placed themselves across her path to receive her impulse, and when thrown forward, they ran on till she overtook them, when they adjusted themselves for a second throw."[67]

Brown, writing of a mother and cubs that he pursued in a boat, with a picked crew of 8 whalemen, says:

"It would, every now and again, when its two cubs were getting left in the rear, stop and (literally) push them up behind; and on reaching the steep edge of the ice-floe, finding that we were fast reaching them, it lifted each of them up on the ice with its teeth, seizing the loose skin at the back of the neck. Once on the ice, they were safe."[68]

In Nelson's "Wild Animals of North America"[69] is a remarkable photograph taken by Capt. F. E. Kleinschmidt in the Polar Regions. It shows a White Bear swimming, while her cub hangs on to her tail, which he holds in his teeth. The legend says: "When the mother Polar Bear scents danger, she jumps into the water, and her cub holds fast to her tail, while she tows it to safety. But when no danger seems to threaten, she wants it to 'paddle its own canoe,' and boxes its ears, or ducks its head under water, if it insists on being too lazy to swim for itself."

A family group were found by Nelson in the pack-ice off Wrangell Island. The male was shot and lost among the floating ice; the female he secured. "With this female," he writes me, "was a yearling cub. The devotion of the mother was remarkable, and exceeded anything of the kind I ever witnessed. When the pursuit became pressing, and the cub began to tire, she swam behind it with her fore paws one on each side of its back, thus shielding it from danger and urging it along. She continued to do this even after a ball had shattered her spine above her hips, and until wounded in various places, and finally disabled."[70]

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[66] Greenland, p. 104.

[67] Arc. Reg., p. 171.

[68] Mamm. Green., p. 344.

[69] 1918, p. 386.

[70] See also Alaska, p. 255.

Among the hunting stories on my desk is one by Lamont, which shows clearly that the cubs' identification of their mother was solely by the individual smell of her skin. To that, dead or alive, they were content to cling. This smell discrimination did not, however, apply in the least to the mother's body after the skin was removed. On that the little reprobates were quite ready to make a merry feast.

Similar evidence is furnished by Donald Macmillan. He says, in April, 1916, his party had killed the mother of two cubs. "Both cubs were now crying for all the world like children with the croup, and would not be comforted. We placed them upon the dead mother, and they ceased whining at once, and began to suck her breasts. Interesting to note, they were now no longer afraid of us, knowing that if their mother did not protest, it must be all right." [71]

Captain Scoresby gives an interesting picture of a little Bear, and a hint of its mental processes. He had secured two cubs, which, "being tolerably tame, were allowed occasionally to go at large about the deck. While the ship was moored to a floe, a few days after they were taken, one of them, having a rope fastened round its neck, was thrown overboard. It immediately swam to the ice, got upon it, and attempted to escape. Finding itself, however, detained by the rope, it endeavoured to disengage itself in the following ingenious way: Near the edge of the floe was a crack in the ice, of considerable length, but only eighteen inches or two feet wide, and three or four feet deep. To this spot the Bear returned; and when, on crossing the chasm, the bight of the rope fell into it, he placed himself across the opening; then, suspending himself by his hind feet, with a leg on each side, he dropped his head and most of his body into the chasm, and, with a [fore] foot applied to each side of the neck, attempted for some minutes to push the rope over his head.

"Finding this scheme ineffectual, he removed to the main ice, and running with great impetuosity from the ship, gave a remarkable pull on the rope; then, going backward a few steps, he repeated the jerk. At length, after repeated attempts to escape this way, every failure of which he announced by a significant growl, he yielded himself to his hard necessity, and lay down on the ice, in angry and sullen silence."[72]

Their food in the nursery was milk—mother had nothing else to offer. But now that they are in the big world, they learn to eat whatever she does; and that means every substance—fish, flesh, fowl, or vegetable—that sky, ice, land, or sea, can, under hard compulsion, be induced to yield.

[71] Four Years in the White North, 1918, p. 242.

[72] Arc. Reg., pp. 173–74.

Animals of this size, growing fast, need a great deal of food. But mother works 24 hours a day, and wins abundant sustenance.

It will be seen by the annals of polar travel, that now is the time when mostly Bears are seen, and the fact that nearly always two young are with the mother, proves her success in caring for the twins.

Their family life continues until the dark days of winter return. Then what?

Mother and cubs have been seen together in the late autumn. Mother and yearling cubs have not been found astir in winter. Mother and yearling cubs have been seen together in the spring. But mother and yearling cubs have *not* been found denned up together in winter.

It is incredible that mother and yearlings should den up separately in winter, and afterwards come together in the spring, for that long break would surely dissolve the family tie.

Most likely they do den together, but, so far it is not recorded; and yearling cubs have not been found so small as to pass for a new brood.

Breeding Age and Span of Life

Blackbears are born in January, and are believed to mate in the fourth June of their lives, that is when $3\frac{1}{2}$ years old and quite mature. But there is some reason for believing that they will occasionally breed a year earlier, as they are full grown at $2\frac{1}{2}$ years.

This seems to be the case also with the Polar Bear. Hearne says: "They propagate when young, or at least before they are half-grown; for I have killed young females not larger than a London calf, with milk in their teats; whereas some of the full-grown ones are heavier than the largest of our common oxen."[73]

In Washington Zoo is a female Polar Bear that came there in 1901, and is still vigorous, but obviously old. She is more than 25 years of age. In London Zoo is a male that has been there for 33 years; he is quite decrepit.

Food

A summing up already made for several other animals applies for this species: It is absolutely omnivorous. I am tempted to say all animals are omnivorous. It comes at least very near the truth; for anything that can be used to distend an empty and bitterly complaining stomach, or contribute one tiny particle of nutrient grease, juice, or fibre, is entered on the White Bear's list of "eats." But his staples and favourites are more easily named; nearly every one is a sea food,

[73] Journey, p. 368.

The Bear feeds on the "kreng," that is carcasses of the Whales, as they are left by the fishers; on Walrus, Seals, Deer, Foxes, and birds when it can surprise them; on eggs, fish, shrimps, mollusks, and indeed on any animal substance that comes within its power; as well as sea weeds, and, in the summer, grass and roots.

As Grass-eater. Nelson, among others, has given us details of the Bear as a grazing animal. After describing the large numbers—yes, *hundreds* of Polar Bears—found on the islands of St. Paul, St. Matthew, and Hall, Bering Sea, in August, 1881, he says: "The Bears were 'all eating grass and roots, digging or browsing, or else heavily sleeping on the hillsides.' 'Their manner of browsing is very similar to the action of a Hog engaged in grazing.' Their well-beaten trails crossed the island in every direction.

"The foregoing notes present this great Bear in quite a different light from the fish and sea-eating animal usually described, and the good condition of the Bears obtained by this party showed that they found an abundance of nutritious food on the almost barren slopes of the island."[74]

As Hunter. Brown says of the White Bear: "Its principal food consists of Seals, which it persecutes most indefatigably; but it is somewhat omnivorous in its diet, and will often clear an islet of eider-duck eggs in the course of a few hours. I have seen it watch a Seal for half a day, the Seal continually escaping just as the Bear was about putting its paw on it, at the *atluk* (or escape hole) in the ice. Finally, it tried to circumvent its prey in another manner. It swam off to a distance, and when the Seal was again half asleep at its *atluk*, the Bear swam under the ice, with a view to cut off its retreat. It failed, however, and the Seal finally escaped. The rage of the animal was boundless; it roared hideously, tossing the snow in the air, and trotted off in a most indignant state of mind."[75]

Another curious hunt which ended in the discomfiture of the Bear, and the escape of the Seal, is thus related by Doctor Kane: "On one occasion, while working my way toward the Esquimaux huts, I saw a large *Usuk* [Bearded Seal] basking asleep upon the ice. Taking off my shoes, I commenced a somewhat refrigerating process of stalking, lying upon my belly, and crawling along, step by step, behind the little knobs of floe. At last, when I was within long rifle-shot, the animal gave a sluggish roll to one side and suddenly lifted his head. The movement was evidently independent of me, for he strained his neck in nearly the opposite direction. Then, for the first time, I found that I had a rival seal-hunter in a large

[74] Alaska, p. 254.

[75] Mamm. Green., p. 344.

Bear, who was, on his belly like myself, waiting with commendable patience and cold feet, for a chance of nearer approach.

"What should I do—the Bear was doubtless worth more to me than the Seal; but the Seal was now within shot, and the Bear 'a bird in the bush.' Besides, my bullet, once invested in the Seal, would leave me defenseless. I might be giving a dinner to the Bear and saving myself for his dessert. These meditations were soon brought to a close; for a second movement of the Seal so aroused my hunter instincts that I pulled the trigger. My cap alone exploded. Instantly, with a floundering splash, the Seal descended into the deep, and the Bear, with three or four rapid leaps, stood disconsolately by the place of his descent. For a single moment, we stared each other in the face, and then, with that discretion that is the better part of valour, the Bear ran off in one direction, and I followed his example in the other."[76]

This same intrepid observer gives us a lively scene of a mother-Bear and her cubs hard-pressed by hunger, attacking openly his camp, and seizing on the barrels of beef whose odour had proved an irresistible lure.[77]

Ferocity of the White Bear

Before me is a pile of data dealing with the moods and temper of the Bear. One portion proves that the creature is timid, flying always from man, shunning an encounter with him at any price. The other maintains that the White Bear fears nothing in the North, knowing that he is king; and is just as ready to enter a camp of Eskimo, or a ship of white men, as to attack a crippled Seal.

There is truth in both statements, and reasonableness if we keep in mind certain facts: First, that the Polar Bear of to-day is considerably changed from the Bear of a hundred years ago. The White Bear, like the Grizzly, has learned that guns are very much more dangerous than arrows or spears. Along his Southland, where he commonly meets whalers or explorers, he is shy, fearful as a Fox. Farther north, where he never meets a gun-man, he is much more aggressive, as is pointed out by Doctor Kane.[78]

Second, a female which has young to protect will always fight, and is much more to be dreaded than the male, though so much smaller.

Third, there is vast individual variation. A solitary roaming male will fight one time and run the next, depending on his humour, his appetite or his previous experience.

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[76] Arc. Explor., I, pp. 261–6.

[77] As above, pp. 387–92.

[78] As above, I, p. 391.

Hutchins sums up his account of the Bear's disposition thus: "They are very fat, and though inoffensive if not meddled with, they are very fierce when provoked."[79]

The testimonies of other travellers are as follows:

"Though such a tremendous animal, they are very shy of coming near a man; but when closely pursued in the water, they frequently attack the boat, seize the oars, and wrest them from the hands of the strongest man, seeming desirous to get on board; but the people on those occasions are always provided with firearms and hatchets, to prevent such an unwelcome visit."[80]

R. Brown says: "Unless attacked or rendered fierce by hunger, it rarely attacks man. . . . I have chased it over the floes of Pond's Bay; and the Bear's only thought seemed to be how best to escape from its pursuers. I should have hesitated a good deal before making so free with the Grizzly-bear of the California wilds (*Ursus ferox*), perhaps the most ferocious animal on the American continent."[81]

Referring to the many Bears seen on the islands of the Bering Sea, as already quoted, Nelson says: They "were easily killed and did not show fight in a single instance, and as they were not at all shy, there was but little excitement in hunting them. They were fat, and were easily approached to within a few yards when asleep; but if they scented the party, they at once took flight toward the hills at a good speed. When surprised, they arose and sniffed at the party, as if curious to learn whether they were friends or foes."[82]

As illustration of the other mind, I give the following:

R. Brown tells of seeing 20 Bears at the carcass of a Whale on the Greenland coast in 1861. Then proceeds: "We were foolish enough to fire a few shots among them, when the Bears sprang furiously from the carcass, and made for our boat. One succeeded in getting its paws on to the gunwale; and it was only by the vigorous application of an axe that we succeeded in relieving ourselves of so unwelcome an addition to our crew."[83]

Again he says: "I have known many men who, while sitting watching or skinning Seals, have had its rough hand laid on their shoulder. Their only chance has been then to feign dead, and manage to shoot it while the Bear was sitting at a distance watching its intended victim."[84]

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[79] Ms.

[80] Hearne, Journey, p. 368.

[81] Mamm. Green., p. 344.

[82] Alaska, p. 254.

[83] Mamm. Green., p. 344.

[84] As above, p. 344.

Plate XXXIII— Polar Bears
Sketches by E. T. Seton 1925

In his "Natural History of Alaska," Nelson says: "With the possible exception of the Californian Grizzly, these Bears are unquestionably the most powerful of their kind. In summer, they rarely attack man, and usually fly from him. One old whaling captain, who has since been lost with ship and crew among the ice, was surprised by one while he was cutting tusks from some Walruses on the ice; the Bear came at him open-mouthed but a blow from the axe laid his skull open, and closed the fight.

"A number of Eskimo on the Alaskan coast show frightful scars obtained in contests with them in winter. One man, who came on board the *Corwin*, had the entire skin and flesh torn from one side of his head and face, including the eye and ear, yet had escaped and recovered.

"One incident was related to me which occurred near Point Hope, during the winter of 1880–81. Two men went out from Point Hope during one of the long winter nights, to attend to their seal-nets, which were set through holes in the ice. While at work near each other, one of the men heard a Bear approaching over the frosty snow, and having no weapon but a small knife, the Bear being between him and the shore, he threw himself upon his back on the ice and waited. The Bear came up in a few moments, and smelled about the man from head to foot, and finally pressed his cold nose against the man's lips and nose, and sniffed several times; each time, the terrified Eskimo held his breath until, as he afterwards said, his lungs nearly burst. The Bear suddenly heard the other man at work, and listening for a moment, he started towards him at a gallop, while the man he left sprang to his feet, and ran for his life for the village, and reached it safely. At midday, when the sun had risen a little above the horizon, a large party went out to the spot, and found the Bear finishing his feast upon the other hunter, and soon dispatched him. Cases similar to this occur occasionally all along the coast where the Bear is found in winter."[85]

Ferocity may be quite right at times, if directed against national enemies who are threatening us with extermination; but when exhibited toward the defenceless of one's own species it is nothing but crime—shocking, disgusting crime. A gruesome illustration of this is furnished by Nansen.

In his winter cabin on Franz Joseph Land, Sept. 28, 1895, he had killed a mother Bear that came with her two cubs to raid his meat supply. The cubs escaped; that is, they escaped from the men. But they fell into the power of a wicked criminal of their own kind—one of the largest he-Bears the explorers had seen. Before raiding the blubber store, says the recorder, the big Bear had "accomplished another piece of work which we only

[85] Alaska, p. 255.

discovered later on. It had killed both the young Bears that had been visiting us; we found them not far off, with broken skulls, and frozen stiff. We could see by the footprints how it had run after them, out over the new ice, first one, then the other, and had dragged them on land and laid them down without touching them again. What pleasure it can have in doing this, I do not understand, but it must have regarded them as competitors in the struggle for food. Or was it, perhaps, a cross old gentleman who did not like young people? 'It is so nice and quiet here now,' said the ogre, when he had cleared the country."[86]

Playfulness

In his boisterous love of rough frolic, the White Bear resembles that black humorist, the Common Bear of the Eastern States. Most of us have seen the Polar Bear at least in the Zoo, playing various games with a dead fish, or even with a wooden ball. There is good reason for believing that many of the monuments left by Franklin were destroyed by Bears in a spirit of riotous fun. The following by Doctor Kane is a vivid illustration of its playful and mischievous disposition. The Arctic explorer had returned to a provision cache carefully made long before, and writes:

"The final cache, which I relied so much upon, was entirely destroyed. It had been built with extreme care, of rocks which had been assembled by very heavy labour, and adjusted with much aid, often from capstan-bars as levers. The entire construction was, so far as our means permitted, most effective and resisting. Yet these Tigers of the ice seemed to have scarcely encountered an obstacle. Not a morsel of pemmican remained, except in the iron cases, which, being round with conical ends, defied both claws and teeth. They had rolled and pawed them in every direction, tossing them about like footballs, although over 80 pounds in weight. An alcohol-case, strongly ironbound, was dashed into small fragments, and a tin can of liquor, mashed and twisted almost into a ball. The claws of the beast had perforated the metal, and torn it up as with a cold chisel.

"They were too dainty for salt meats; ground coffee they had an evident relish for; old canvas was a favourite for some reason or other; even our flag, which had been reared 'to take possession' of the waste, was gnawed down to the very staff. They had made a regular frolic of it; rolling our bread-barrels over the ice-foot and into the broken outside ice; and, unable to masticate our heavy India-rubber cloth, they had tied it up in unimaginable hard knots.

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[86] Farthest North, 1896, p. 426.

"McGary describes the whole area around the cache, as marked by the well-worn paths of these animals; and an adjacent slope of ice-covered rock, with an angle of 45°, was so worn and covered with their hair as to suggest the idea that they had been amusing themselves by sliding down it on their haunches. A performance, by the way, in which I afterward caught them myself."[87]

Strange Incidents

"With regard to curious adventures, on one occasion, a Bear, which was attacked by a boat's crew, made such formidable resistance, that it was enabled to climb the side of the boat, and take possession of it, while the intimidated crew fled for safety to the water, supporting themselves by the gunwale and rings of the boat, until, by the assistance of another party from the ship, it was shot, as it sat inoffensively in the stern.

"With regard to narrow escapes, a sailor, who was pursued on a field of ice by a Bear, when at a considerable distance from assistance, preserved his life by throwing down an article of clothing whenever the Bear gained upon him, on which it always suspended the pursuit until it had examined it, and thus gave him time to obtain some advance. In this way, by means of a hat, a jacket, and a neckerchief, successively cast down, the progress of the Bear was retarded, and the sailor escaped from the danger that threatened him, in refuge afforded him by his vessel."[88]

Major L. T. Burwash, of Ottawa, tells me that among the Eskimos it is widely believed that the Polar Bear kills Walrus with a block of ice, or even a big rock. He locates the sleeping Walrus, and, realizing that his own paws and teeth can have little effect on the thick skin and blubber of the Walrus, he sneaks up, carrying a huge block of ice or rock on his shoulder, and with it, crushes the Walrus's skull.

A Baffin Land Eskimo, named Saila, made and gave Burwash a carved ivory group, representing a Bear approaching with a block of ice, to attack a pair of sleeping Walruses. From this group I made the illustration which appears in the Plate.

When I was in Edinburgh Zoo on Jan. 28, 1925, I watched for an hour two Polar Bears playing in the water. One of them seized a large bone (the femur of a Horse), raised it between both paws, and threw it in the direction of the other again and again, about 10 or 12 feet each time. But obviously he knew how to throw, which lends at least a little colour to the Eskimo story as above.

[87] Arc. Explor., I, p. 276–78.

[88] Scoresby Arc. Reg., 176–77.

PLATE XXXIV.—ESKIMO CARVINGS IN IVORY

Showing Polar Bear using ice-block to kill sleeping Walrus
Actual height of Bear (to head) $1\frac{7}{8}$ inches
Actual length of stand $3\frac{1}{2}$ inches
Carvings lent by Major L. T. Burwash, of Ottawa

When Nahnook Goes A-Hunting

The bright, brief Arctic summer has gone. The ever-shortening days have come; and with them, frosty nights and flurries of snow. The marshes are frozen now, their summer birds are flown; and Nahnook, the old he-Bear, losing interest in his mate, his companion of the midsummer golden days, goes off a-hunting by himself.

The shores, the marsh, the islands, and the icebergs, were good foraging grounds during those sunlit times, and furnished many kinds of fish, flesh, and fowl. But now the growing power of frost is sealing in the heaving flood. When all the world is hard and white, there is open water only where the battling sea and the sullen ice-edge meet.

Over the long white stretch ambles Nahnook, swinging on with consummate power and mile-devouring speed. Ever and anon he climbs some ice-bump for a lookout; or, failing that, stands high on his hind legs, raises his long dragon neck, and swings his wind-wise nostrils in the breeze, keen to discern and analyze the faintest hint of food or hunting chance.

All day, and half the night, he may have travelled across the rugged white, going with something like certainty to the nearest bay, the skirt of the broad ice-sheet, the edge of the open sea.

The floe is barren of life and food, as a sandy desert is of drink. But all the wild life of the North seems to gather at its rim. Here are floating clouds of mud, ploughed up by travelling bergs; here are shrimps, and tiny sea-beasties clinging to the water-trash, or washed up on frozen ledges. Here are fish of many kinds. Here, even in winter, are birds and beasts to feed on the fish. Here in the water, and on the ice, are Seals of three or four kinds; and here, last and biggest of the possibilities, are great Walruses worthy of the biggest Bear that ever reared his long, massive form like a white pillar against the dark sky.

Not the shortest road to the ice-front took Nahnook; but the one that was upwind. Its pleasant promises he tasted with his nose, long hours before his keen eyes glimpsed its dark, hard edge, or his dull ears sensed its splash.

Little chance to feed had he. A Fox or two he may have seen, or, when near the land, a travelling Caribou. But their instincts are just as good as his own; and their winged heels much better. They leave him far behind, and he swerves not from his open-water search.

Bitterly cold is the wind, and icy cold the water; but these are to his liking, and with joy, like that of a boy at the swimming hole, on a broiling summer day, Nahnook plunges in. However cold the air, he can always

warm up in the sea. For as long as it *is* sea, it is not colder than 27°, and besides, it never contacts his skin.

Now he is at home. He would rather swim than march, and all along the broken edge, he paddles swiftly, silently. Sniffing, sniffing—raising ever and anon from the water that long, reptilian neck to scan the ice-edge or sniff the air of a higher level.

Away out on the water, he sees a strange-looking, dark thing with two white spots on it. His eyes say, "It is of value"; his nose says nothing, for the wind is the wrong way. The great Bear dives and, in half a minute comes up under the brown thing. Oh, poof, disgust! It is nothing but a low, small mass of discoloured ice, with two white gull feathers on the top by chance. And he swims back to the ice-edge.

For half a mile, he examines its ins and outs, sniffs long at a shelf that had faint odours of Seal. He shoots up on to the ice, slowly raises himself up, up on his hind legs, till he is towering ten feet above the level floe. He scans the ice from near at hand to farthest ken. Nothing he sees worth while; his eyes make no report of interest. But his nose does. There are many faint wireless messages on the wind. Some of them are of neither value nor appeal. But one there is that suddenly turns him rigid. He expands his nostrils, sniffs in strongly, stares up the wind, swings his long, sinuous neck and head, reaches up higher, then lower, to try all windy currents.

He drops to his front feet, and silently glides into the water, to follow, follow, follow that fragrance sweet, alluring, the smell of a Walrus—a Walrus, doubtless landed on the ice.

The Seal is to Nahnook what the Deer is to the hunter—his safe and favourite prey. But sometimes, under pressure of starvation, the hunter ventures to match his power with that of an Elephant, and faces a very doubtful issue. So Nahnook scenting and sensing afar the giant form of the Water-elephant, the Walrus, is thrilled with the certainty of battle and the hope of a feast.

Three times as big as Nahnook is the huge tusker, and his habit is to live in bands; so that there are few who dare to face him. Even Nahnook must prowl stealthily around, like a Wolf about a Buffalo herd, seeking for a straggler, or a young one, before risking an attack.

It is three days since his last meal, and Nahnook is hunger-keen. He sinks into the pleasant, icy sea, and swims quickly, but warily, up wind. Two miles he covers before, on the long white icefield, black against the dark gray sky, he finds the herd—a score of huge creatures, each with a pair of gleaming ivory tusks, and fighting power. All but one—a baby at the very choicest time when it could serve as food.

The Walruses, banded together on the ice, have nothing to fear from open attack by Nahnook. In the water too, they are superior to him. There is but one chance for the Bear. If he can seize the calf and rush landward, the slow-moving tuskers cannot follow far. He may so win his feast.

Swimming low, and keeping behind a floating ice-cake, he approaches within a few springs. The snoring of the sleeping Walruses is loud and continuous. Only the mother of the young one shows signs of alertness. She throws up her nose, uttering a long sniffing from time to time, puts her flipper about her baby, and settles down again. Gathering his force, Nahnook springs on to the ice, dashes as silently as possible at the big fat calf. As he seizes it, it utters a loud roaring bleat. Instantly all is rush and noise. The band of tuskers splash into the sea.

But the mother charges the Bear that is dragging the young one inland. All return now, uttering loud snorts and short roars, as Nahnook gets away, dragging the fat and bawling calf, pursued by the mother. But the calf weighs half as much as he does. Father, mother, and a dozen of the Walruses are after him.

He is barely succeeding, when of a sudden, the whole ice-floe, still thin, cracks and sinks beneath him. The heaving and ramping of the Elephant herd, gathered at one spot, was over-much for it. All are struggling in the water. Here the Walruses have every advantage. Nahnook is hopelessly outnumbered by well-armed creatures, three times as heavy as himself. He lets go the calf, scrambles out and over the broken ice as fast as he can, nor rests till afar on the solid floe.

More than ever is the urge of hunger on him now, and back he turns to seek the bounty of his Mother Sea.

For a while, he skirts the edge. But the Walrus herd is far away now. The wind is cold, and he takes to the water to be comfortable.

Swiftly he swims along the rim of the ice. Low in the water is he now; only the top of his head is seen above. In and out the icy bays he goes, sometimes diving under a projecting floe. Then, as he rounds a point, he gets a thrill. His eyes say: "A Seal." His nose says: "It is nothing." As usual, his nose is right. It is nothing. But now he prowls with extra care, and after another long swim, he gets the sweet and appetizing whiff that surely stands for "Seal near by."

The big Bear sinks till only his eyes, his ears, and his ever-wise nose are out; and slowly scouts, getting presently a stronger taste of that good smell.

Oftentimes, the Seal basks on the edge of the ice, ready for a plunge;

and in the water, the Seal can laugh at Nahnook. But all along the ice-front, the Bear sniffs, and sees nothing. He goes so far that the alluring scent is lost. At once he turns, for that might mean that now the Seal smells him. He swims back till again the smell-guide is strong, then cautiously approaches the edge, here higher than elsewhere. He puts both paws on the top, and slowly rises till his flat head, his nose, and his eyes are above the line; and the sight he sees surely thrills him.

There, thirty or forty long hops from the edge, is a big, fat Seal, lazily dozing. But why so far from the edge, when the ice is replete with perils, and his one safe refuge always is deep water?

For long the big Bear stares in puzzlement. Absolutely still he is. His head is merely a bump of ice, if the Seal's eyes turn this way.

Then slowly Nahnook solves the problem. The Seal is feeling safe because just before him, yes, almost under his chest, is a blow-hole, an *atluk*, a round hole made and kept open by himself as a plunge in time of danger.

Nothing could approach him over the level ice without being seen. Hence, his perfect serenity. His ever-protecting Mother Sea is down that hole, and he lazes and drowses, with eyes half closed, his ears and nose wide open.

How Nahnook's chops do water! How firmly he has to restrain himself from that glorious, useless rush!

But he has killed many a Seal before now. He knows the kind that sit on the floe rim, and he has seen his mother capture this kind that sits by its plunge hole. Nahnook takes his bearings, slides slowly down into the deliciously cool water, dives under the ice, and swims with unerring directness to the under side of the plunge. The moment he arrives, he taps the ice with his paw. The Seal, startled by the thud, plunges down, and instantly the big Bear has him.

The hole is too small for the Bear to pass through. But it is an easy and delightful exercise to swim back to the open water with the fat Seal in his mighty jaws.

At once he shoots up on to the broad icefield, with his prey in his teeth, like a Mink landing with a trout. Away he ambles from the margin to the level stretch a hundred hops away.

The Seal is still squirming as Nahnook throws it down, but a blow of his huge paw crushes its skull, and the delight of feasting on red-running, quivering flesh is his—a banquet that for zest, not Belshazzar's wildest orgy could out-thrill in animal joy. A hundred-pound Seal it is; but Nahnook stops not till it is finished, hide and bones. Then, curling up comfortably

on the ice behind a higher ledge, warm, fed, and happy, he sleeps the good sleep of one who has health and strength, and has solved all present problems.

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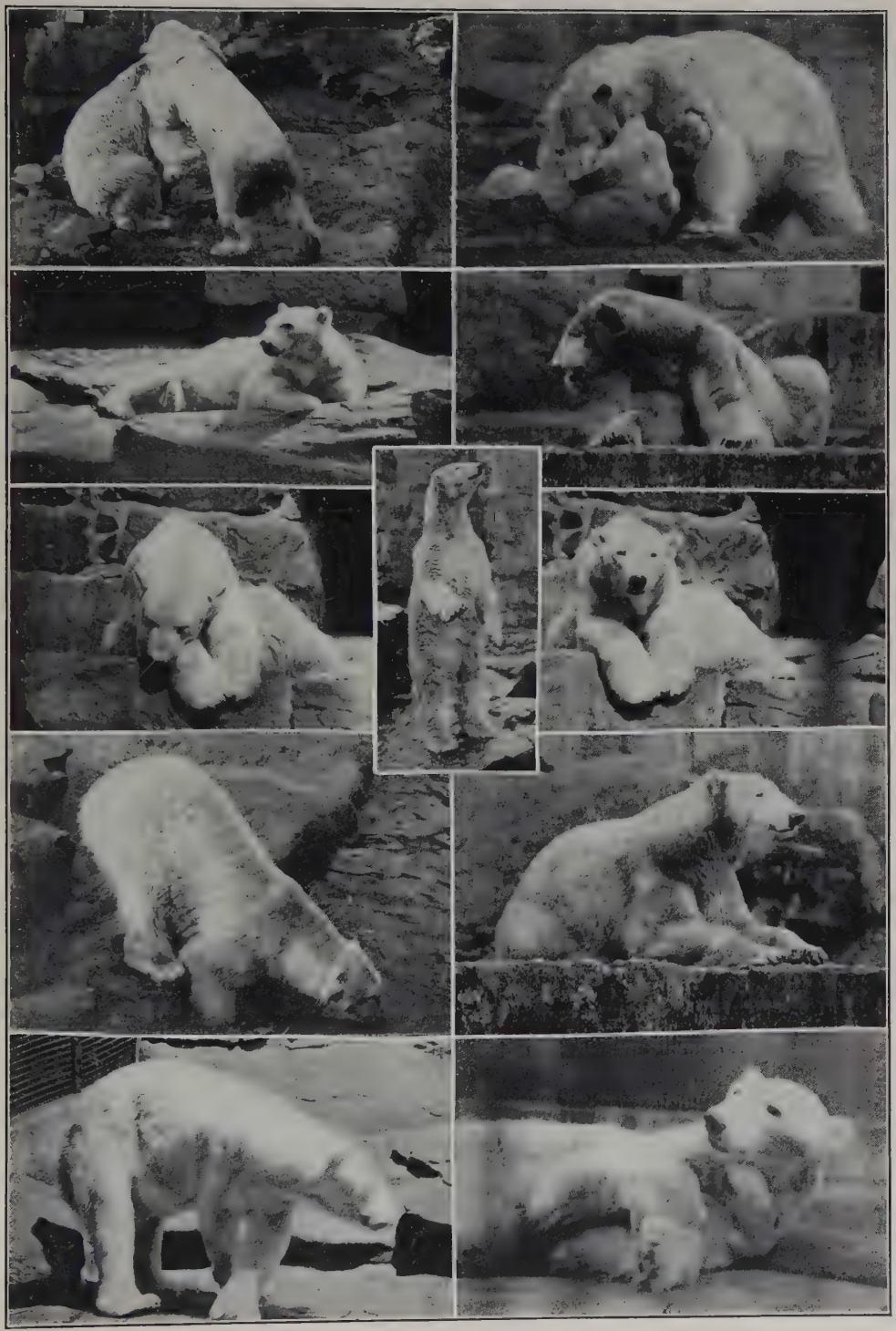

PLATE XXX.—POLAR BEARS, NO. 2

PLATE XXXII.—POLAR BEARS FROLICKING

LIFE XXIII—THE RACCOON

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Raccoon, Coon, or Mapachin

Procyon lotor (Linnæus)

(Gr. *Procyon*, from *pro*, before; *cyon*, a Dog—the name of a star-group that rises just before the Dog-star. The name was given to this genus by Storr in 1780, probably without special reason. L. *lotor* a washer, from its habit of washing its food)

Ursus lotor Linnæus, 1758, Syst. Nat., X ed., I, p. 48.
Procyon lotor Desmarest, 1819, Dict. d'Hist. Nat., XXIX, p. 91.

Type Locality—Eastern United States

French Canadian, *le Raton.*
Cree and Sauteaux, *Eś-see-ban.*
Ojibway, *Eś-see-pan.*
Yankton Sioux, *Way-atch-a.*
Ogallala Sioux, *Weé-cha.*
Cheyenne, *Mach-coon* (Abert).
Panama, *Mapachin* (Goldman).
Mexico, *Mapachi* (Nelson).

"Coon" is abbreviated from "Raccoon" or "Racoon," which is the Englished form of *Arocoun*, *Aroughcun*, the Indian name of the creature in Virginia. The earliest notation of this is as follows:

"The Chief Beasts of Virginia are Beares, lesse than those in other places, Deere like ours, *Aroughcun* much like a Badger, but living on trees like a Squirrell."[1]

Josselyn (1674) gives *Rattoon* as a native variant; hence, no doubt, the French.

The Raccoon Family, or *Procyonidae*, comprises middle-sized animals, kin of the Bears; having on each foot 5 well-developed toes with fixed claws, the soles naked, the hind feet plantigrade; pointed nose and ears; tail, rather long and bushy, usually ringed.

The genus *Procyon* (Storr, 1780), has the above characters, and has the teeth:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{4-4}{4-4}\text{; mol. } \frac{2-2}{2-2} = 40$$

[1]Purchas, Pilgrimages, 1617, Eighth Booke, Chap. 5, p. 945, citing Capt. Smith as authority.

In addition to the Family and generic characters, this animal has unmistakable specific peculiarities.

Size. An adult ♂ killed at Springfield, near Toronto, Ont., June 25, 1888, was 32½ in. (826 mm.) from tip of nose to tip of tail-bone. The head and body from nose to ischium, were 23¾ in. (604 mm.); the tail-bone, 10⅜ in. (263 mm.); from tip of front toe to tip of outstretched hind toe, 37⅜ in. (950 mm.). This was a very fine and fat individual. Hind foot of another specimen was 4¼ in. (108 mm.).

A ♀, caught at the same place, fifteen days earlier, was 31½ in. (801 mm.) from tip of nose to tip of tail-bone; the head and body, from nose to ischium, were 21⅛ in. (552 mm.); the tail-bone, 11 in. (280 mm.). She was still in milk; her 8 teats were as shown in the Plate.

Weight. The above ♂ weighed 18 lbs.; the ♀ barely 10. I consider the ♂ about average size, and the ♀ small.

An Indiana trapper, writing to *Hunter-Trader-Trapper*, March, 1925, p. 17, says that out of all the Coons he has caught, "the largest weighed 21½ lbs., and it was a large Raccoon."

H. C. Taylor, a Coon hunter of Carverton, Pa., writes of a big one that he carried home: "We have scales in the mill, and I weighed him. He weighed 21¾ pounds. This is the largest I ever saw."[2]

Bachman gives 22 lbs. as the ascertained weight of a good sized male.[3]

S. B. Chase, of Peck, Idaho, writing of a Coon hunt in which he and his boy killed 5 Coons, says: "One Coon weighed 24 lbs."[4] Presumably this was the largest.

"A very large and fat individual in Minnesota, weighed 30 lbs., but half of that would come near the usual weight when not very fat."[5]

Manly Hardy, after a lifetime among them in Maine, and handling hundreds, says: "One was caught which weighed, when the entrails were all removed, 32 lbs., and another also disembowelled, weighed 26 lbs. I know these weights to be correct, as they were weighed on two different sets of scales. Brewer, Maine, Nov. 15, 1902."[6]

The larger one above might have weighed 40 pounds when alive. The following by "Stanstead" (N. P. Leach, of Swanton, Vt.), is the only heavier with the backing of a reliable observer:

"Mr. W. W. Macie, postmaster, store-keeper, trapper, and fur-trader,

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[2]Recreation, July, 1898, p. 56.

[3]Q. N. A., II, p. 76.

[4]Forest & Stream, Jan., 1925, p. 36.

[5]V. Bailey, Mamm. Dist. Col., *P. B. S. W.*, May 1, 1923, p. 124.

[6]Forest & Stream, Nov. 29, 1902, p. 426.

of Sheldon Springs, Vt., caught a Coon that, after being knocked on the head and bled, weighed—not guessed at, but weighed—49 pounds."[7]

Colour. In general, the Coon is of a dull brownish-gray, becoming yellower on the back, strongly yellow on nape and on tail, and a paler gray on the belly and feet; on all the upper parts, especially along the spine, the long hairs are black tipped, and on the under parts they are white tipped. On the cheek is a black patch that includes the eye, and joins with the narrow blackish stripe that runs from the nose to the dark colour on the forehead. Around this, the face is dull white, whitest in a band above each eye; the lower back part of the ear is black, which joins with a black patch on the neck behind the ear; the tip of the ear behind is whitish. The tail, beginning with the tip, has 6 to 7 rings of very dark brown or black on a pale yellowish background. The under-fur is dark brownish-gray, and shows much on the under parts; the throat also is dark brownish-gray; the eyes are dark; the whiskers white.

The sexes are alike.

Albinos have been reported from time to time. In Michigan, according to Norman A. Wood: "A pure albino Raccoon was taken in Lodi Township, about 8 miles southwest of Ann Arbor, on Dec. 24, 1911, by J. Alber. It was very fat, although no doubt less than a year old, and weighed 12 lbs. This is the sixth albino of this species known to the writer, from this county during the last 40 years."[8]

The New York Zoological Park has had one also. Its picture appears on p. 128 of *Zool. Soc. Bull.*, Nov., 1921.

Melanos also are not unknown. In Cordington, Ohio, is a fur ranch in which the melano or black Raccoon is being successfully bred. The owner is L. S. Russell.

When seen alive, the Raccoon is readily distinguished by its size, the black mask on its face, and its *bushy tail with black rings.* The Cacomistle is like it in having a long tail with black rings; but the very small size, the long slender body and tail, and the cat-like face of the latter, are ample distinctions.

Races

The following geographic forms have been recognized:

lotor Linnæus, the typical form. T. l., Eastern United States.

elucus Bangs, a darker, shorter-haired, long-tailed race. T. l., Oak Lodge, near Micco, Brevard Co., Fla.

[7] Forest & Stream, July 15, 1899, p. 45.

[8] Notes on Mich. Mamm., 14th Rep. Mich. Acad. Sci., 1912, p. 164.

mexicanus Baird, a large, pale gray race, with long tail. T. l., Espia, Sonora, Mexico.

hernandezi Wagler, a very large dark form, with very narrow rings on tail. T. l., southern Mexico.

pallidus Merriam, a medium-sized pale gray form, without any yellow suffusion. T. l., New River, Colorado Desert, Imperial Co., Calif.

insularis Merriam, like *lotor* and *hernandezi*, but smaller and paler; ears smaller; top of head grayer. T. l., Maria Madre Island, Tres Marias Islands, Jalisco, Mexico.

californicus Mearns, much like *psora*, but slightly smaller and considerably paler. T. l., Ocean Beach, San Diego Co., Calif.

crassidens Hollister, like *hernandezi*, but larger molariform teeth. T. l., Talamanca, Costa Rica.

fuscipes Mearns, largest of all; colour much like *lotor;* feet dark brown; blackish mask expanded so as to cover whole face. T. l., Las Moras Creek, Fort Clark, Kinney Co., Tex.

ochraceous Mearns, skull and teeth indistinguishable from *mexicanus;* colour pale; pelage long and soft. T. l., Sonozita River, near Quitobaquita, Sonora, Mexico.

maynardi Bangs, a very small insular form. T. l., New Providence Island, Bahamas.

minor Miller, size and general appearance as in the other small forms. T. l., Pointe-à-Pitre, Gaudaloupe, Lesser Antilles.

psora Gray, very dark in colour, with excessive black tipping; by some considered a distinct species. T. l., Sacramento, Calif.

pacifica Merriam, a very dark form, with exaggerated black rings on the tail. Akin to *psora*. T. l., Lake Keechelus, Kittitas Co., Wash.

pumilus Miller, much like *lotor*, but of dwarfish size. T. l., Ancon, Panama.

pygmaeus Merriam, like *hernandezi*, but about half the size, chin and throat separated by a strong band of black. T. l., Cozumel Island, Yucatan, Mexico.

Range and Records

Map II sets forth the territory of this wide ranger. The numerous outlying records, spotted on the map, are evidence that the Raccoon is spreading, if not increasing.

In Manitoba, during primitive times, it was quite abundant along the Upper Red River, as is attested by the Journal of Alex. Henry, the fur-trader, who, about 1804, wrote at Park River House, on Red River, 35 miles south of the Boundary. Here he collected annually from 100 to 200 skins. It is still found in southwestern Manitoba, but is exceedingly rare, although, according to Herrick, it ranges over the entire wooded parts of Minnesota.[9]

Fort Ellice. I saw a very large and dark specimen that was taken on the Upper Assiniboine, near Fort Ellice, about 1884.

In September, 1904, J. J. G. Rosser, of the Hudson's Bay Company, at Winnipegosis, showed me a Coon skin taken on Waterhen River at the second rapids by an Indian, Francis Katchaway, October, 1903. The trapper did not know what he had caught—said it looked like a Cat. None of his people had seen one before. This is the only one ever taken near this post, and is the northernmost record for the Province.

Pine Creek, Man. Angus Brabant, Inspector for Hudson's Bay Company and former Chief Factor, saw a Raccoon taken at Pine Creek, 60 miles north of Dauphin, Man., Lake Winnipegosis, 1890.

Nipigon. "William McKirdy, of Nipigon, told me that a few years ago, a Raccoon was killed by some Indians near Lake Nipigon, and brought to the Hudson's Bay Company's post. Neither Indians nor traders ever had seen the animal in the region before, and to most of the former it was entirely unknown."[10]

Touchwood Hills. George F. Guernesy writes me from Fort Qu'Appelle: "*Dec. 14, 1906.* Within the last 20 years, I have known of 2 Raccoon being taken some 50 miles north of here, in Touchwood Hills, which are heavily timbered with poplar and birch. But they are so rare that the Indian who took one of them, did not know what it was; there are none in the Qu'Appelle Valley—not enough timber, for one thing."

Red Deer River. A newspaper clipping recently directed my attention to a still farther record. On writing to the person interested, W. H. Jaeger, of Edmonton, Alta., I was courteously furnished with particulars: A Raccoon, the first ever heard of in the district, was taken by an Indian about 1903, on Red Deer River, at a point some 75 miles south of Edmonton.

Ponoka, Alta. W. H. Jaeger announces another, also captured by an Indian, secured near Ponoka, 40 miles south of Edmonton, in February, 1905. The skins were brought in for sale to Thomas Hourston's store at Edmonton.

[9]Mamm. Minn., 1892, p. 139.

[10]Miller, Mamm. Ont., Proc. Bost. Soc. Nat. Hist., April, 1897, p. 41.

Peace River. C. C. Chipman, the Hudson's Bay Company Commissioner at Winnipeg, wrote me on Dec. 3, 1906: "There was 1 Raccoon killed in the Peace River country about 15 years ago, and they did not know what it was."

Attawapiskat Lake. William McInnes, of the Geological Survey of Canada, examined the skin of one killed at Attawapiskat Lake (Lat. 52° 20′, Long. 87° West) in the winter of 1893.

Gaspé, Que. G. G. Goodwin writes: "One specimen was reported by Mr. De Mille to have been taken at Rivière Magdeleine during the fall of 1923. It was caught in a trap set for Mink, on the bank of the river, by a trapper. The incident excited a great deal of curiosity, as none of the natives had ever seen an animal like it before. The foreman of a pulp mill located there, who saw the specimen, said it was a Raccoon, after consulting Wood's Natural History on his visit home in Ottawa for Christmas."[11]

Home Range and Haunts

We have little light on the individual range, but it seems wider than might be expected for such a slow-footed creature. Bailey speaks of Coons in Texas, going regularly half a mile to a mile from their dens to their hunting grounds, and, of course, back before dawn.[12] Bachman tells of following a pair through the snow; they made a journey of about a mile, ending where they began.[13] W. S. Williams, of Panther Creek, N. C., informs me that a pet Coon that he had, escaped, and within a couple of days was killed while raiding a hen-roost 5 miles from the house. Obviously this one had no home.

The Raccoon is a creature of woodland edges, preferably hardwood. Dense coniferous forests do not please it; one reason being that hollow trees are essential to its well-being. It does occasionally lodge in rocky crannies, even in bank burrows, but this is exceptional, and imposed by the absence of more congenial quarters. No matter what its daytime residence is, its nightly prowling is always close to the water. So that we look for it with certainty in all temperate parts of America, where big timber and water abound; and we are perfectly safe in omitting from the map an arid region where timber is scarce, and running water unknown.

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[11] Mamm. of Que., Journ. Mamm., Nov., 1924, p. 253.

[12] N. A. F., No. 25, 1905, p. 193.

[13] Q. N. A., II, p. 81.

Numbers

The abundance of Raccoon and other game in the golden age gone by, and at the same time the scarcity of money, are reflected in the following old record, furnished by Harry Chase:[14]

"In 1788, it appears that in the mountain section of East Tennessee, the inhabitants formed themselves into a separate State, and called that section the 'State of Franklin.' At that time, money was scarce with which to pay the officers of the new State, so in October of that year [Oct. 18, 1788], the legislature of the 'State of Franklin' enacted the following law to provide for the compensation of their officers:

"'Be it enacted by the General Assembly of the State of Franklin, and it is hereby enacted by the authority of the same, That, from the first day of January, A. D. 1789, the salaries of the civil officers of this Commonwealth be as follows, to-wit:

"'His excellency, the governor, per annum, 1000 Deer skins; his honour, the chief justice, 500 do. do.; the attorney-general, 500 do. do.; secretary to his excellency, the governor, 500 Raccoon, do.; the treasurer of the State, 450 Otter, do.; each county clerk, 300 Beaver, do.; clerk of the house of commons, 200 Raccoon, do.; members of assembly, per diem, 3 do. do.; justice fee for signing a warrant, 1 Muskrat do.; to the constable for serving a warrant, 1 Mink do.'"

It will be noted that, as set forth in the section on Hibernation, Alex. Henry's men captured 197 Coon skins on the Red River between Sept. 8, 1800, and March 5, 1801; really 2 months trapping, as during 4 months of the time, no Coons ventured out. This, one must admit, indicates abundance. There are no such numbers in that region to-day.

Manly Hardy, relating his Maine experiences, says: "I know of over 30 killed in a space of not over 8 miles long by 2 wide, and I do not think that I heard of two-thirds of what were taken. These were nearly all caught in traps set in gardens and corn patches."[15]

According to the official Game Reports for 1921, 5,910 Raccoons were legally killed within the State of Pennsylvania.

It is very certain that no average man ever travelled or trapped in the Adirondacks or the Catskills for a month, without passing within hearing of 100 Coons. And how many did he see? None! Probably not one!

Its numbers are much greater than is commonly supposed. In 100 acres of hardwood bush, near Toronto, in the '80's, I got 3 Coons, and had

[14] Forest & Stream, Oct. 7, 1911, p. 552.

[15] Forest & Stream, Nov. 29, 1902, p. 426.

PLATE XXXV.—COON AND LAGOON
Drawing loaned by New York Zoölogical Society

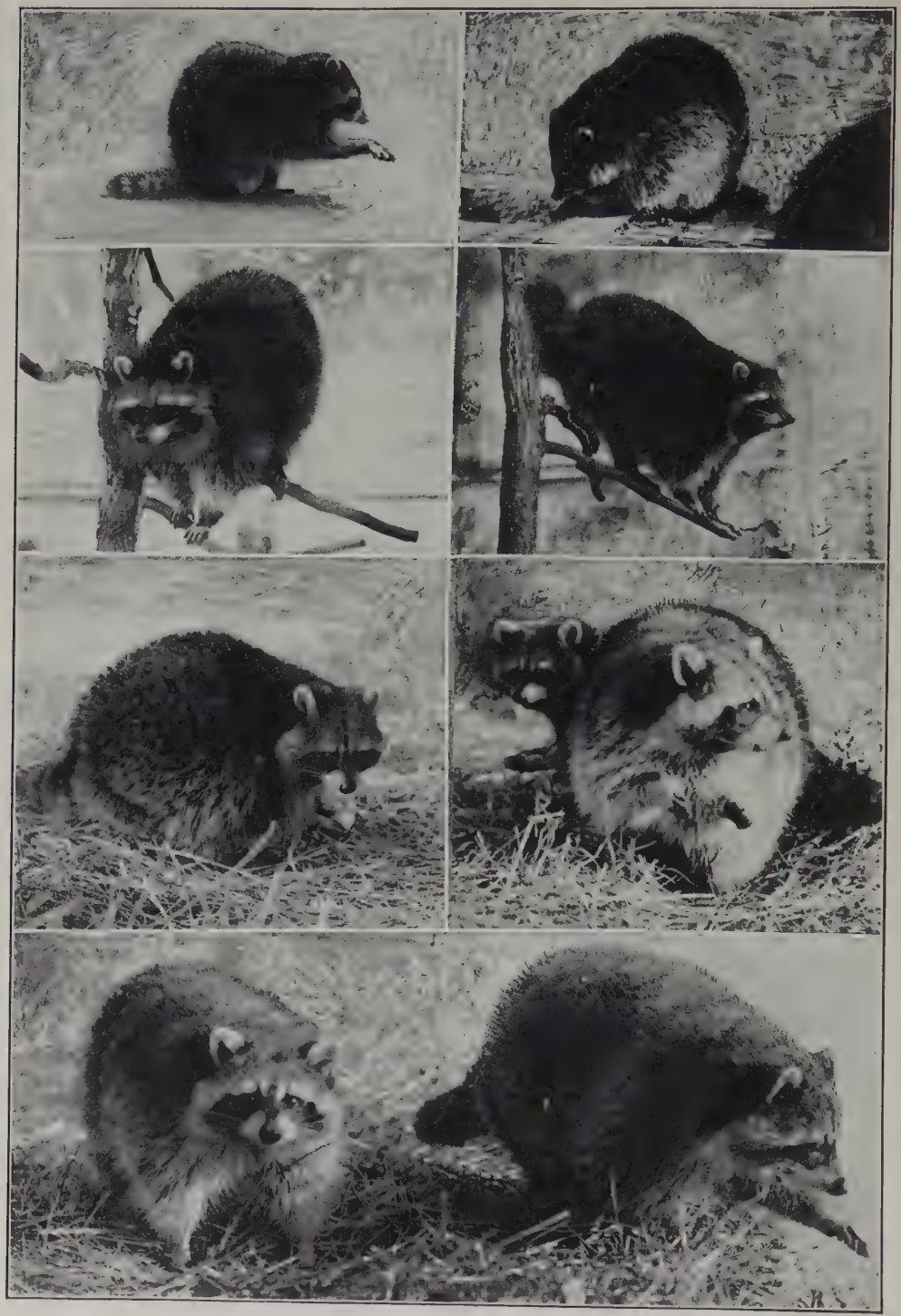

PLATE XXXVI.—PHOTOS OF RACCOONS IN WINNIPEG ZOO
Photos by E. T. S.

evidence of several remaining. Yet they were considered scarce. This woods was chiefly second growth; heavy timber has proportionately more Coons.

W. E. Cram says: "I cannot discover that they have ever been abundant in this vicinity (Southern New Hampshire) from the time when the country was first settled to the present. In fact, all those that I can obtain any account of as having been killed here, until quite recently, appear to have been regarded almost as curiosities hardly to be recognized even by the oldest hunters; yet one would suppose that formerly the country must have been much better suited to their tastes than now.

. . . . . .

"Within the last two or three years, however, Raccoons have unquestionably become not uncommon in this and most of the neighbouring townships, so that Coon hunts are becoming quite popular, and usually prove fairly successful, the barking of Coon Dogs on moonlight nights in the autumn being now a common sound."[16]

Similar reports come from many of the half cleared regions, such as northern Ontario, Maine, Minnesota; for the reason that their enemies, the Fisher, the Wolf, and the professional trapper, are reduced in numbers, and the farms which are increasing in number, make for better food possibilities than does the virgin forest.

In the famous Cooning grounds of the Ohio and Mississippi Valleys, it seems certain that the species is greatly reduced in numbers.

Nevertheless, one is nearly safe in claiming that the Raccoon is still found in every portion of his ancient range, except where the timber has been wholly removed; which means only central Iowa, Illinois, and Indiana, and perhaps the south peninsula of Ontario. Even in such a popular suburb of New York City as Greenwich, we still find the Raccoon a regular denizen of our woods and rocks.

Ancient Population. As we have seen, 5,910 Raccoons were lawfully killed in the State of Pennsylvania during the season of 1921.[17] Doubtless, as many more were illegally killed. That is, 10,000 may have been the slaughter of that season. Twenty per cent. is the heaviest drain that the species can stand—and they are standing it. Therefore, there may be 50,000 Raccoons in Pennsylvania to-day. Pennsylvania's area is, in round numbers, $\frac{1}{60}$ of the Coon range, which would imply a primitive Coon population of 2,500,000.

[16] American Animals, 1902, pp. 248–49.

[17] Game Comm. Rept.

Again, Poland's Fur Trade Reports show that for 40 years prior to 1891, about 500,000 Coon skins were marketed each year from North America. It is probable that not more than half the Coons killed are sold in London. Therefore, the low annual return of 500,000 would represent an annual kill of 1,000,000; so that the Coon population in those days might easily have been 5,000,000 in North America.

As Mexican Coon fur is worthless, we can see by the map that the region paying this tribute of 1,000,000 a year, without apparently suffering, is about two thirds of the United States, or 2,000,000 square miles, which is about half of the Coon range. This means more than a pair of Coons to every square mile of their range.

Fluctuations. The Raccoon—and indeed most creatures—are subject to some obscure law of increase and decrease. Sometimes these variations are due to climate or natural conditions; but sometimes other causes seem to be at work.

Manly Hardy credits the Raccoon with a local migration. They came into his locality when first the corn was fit to eat, and "when all the corn was gone, they disappeared as suddenly as they came."[18]

The difficulty seems to be that no one ever saw any of the creatures "on the trail," and the migration theory is a mere guess.

Fur, Flesh, and Tracks

The fur is the creature's chief contribution to human comfort. Half a million skins are shipped to London in good years, to be manufactured into overcoats, sleigh-robes, and motor-car wraps. For such use, the Coon pelt is particularly well adapted, having a deep warm fur, of the coarser kind, on a strong and durable leather. The abundance of the animal keeps the price low, so it has an established popularity.

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 167,027 skins of this species, an average of 1,847 each year. The lowest was 0 in 1829; the highest, 24,783 in 1866. The average for the 10 years, 1895 to 1905, was 3,814.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 27,138,479 skins were taken by the other American companies, an average of 382,091 each year. So that the average annual catch of Raccoon for fur, is about 384,000. The record high year was 1883, when 711,071 were received by the traders.

The Raccoon skins taken in Canada, according to the official Fur

[18] Forest & Stream, Nov. 29, 1902, p. 426.

Returns, during the 3 years 1919 to 1922, were as follows: 30,343; 18,116; 35,229. As the Coon range in the United States is 16 times as great as in Canada, this shows that there is no falling off in the Coon population. Of the Coons taken in Canada, $\frac{4}{5}$ came from Ontario.

At the London annual fur sales, held at Lampson's, March, 1906, the highest price paid was 26 shillings ($6.24) each for 34 unusually large, dark, fine skins; but this was exceptional. The nearest to this was 12 shillings ($2.88) each for 236 No. 1 large skins. More usual prices were 6 shillings ($1.44) and 7 shillings ($1.68), and many lots of inferior quality were sold at 8 pence (16c) and 1 shilling (24c) a skin.

Since then, the price has doubled; the average value of the Canadian catch in 1921–22 was, according to the official Reports, $3.71.

The roast Coon is the supposed proper finish of a Coon hunt. Young ones killed without a battle and properly cooked are palatable, but a tough warrior male, to whom death came in a long, desperate fight, is not fit for human food.

Tracks. The tracks are shown in Plate XXXIV. The pairing of the front feet when at full speed, agrees with the tree-climbing habit of the species.

Social Instincts—Voice, Etc.

It is a common thing to find half-a-dozen Coons in one hollow tree; it is a rare thing to find a solitary Coon. Therefore, I consider the Coon a sociable animal. But they do not run in bands, except as families, nor are several nests placed together; therefore, they are but slightly gregarious.

During approach, its singular black-masked face, during retreat, its yet more singular ringed tail, are label marks that proclaim to friend and foe with equal emphasis that *this gray beast is a Coon.*

But its voice is even more serviceable to it. The querulous "churr" of a captive Coon squabbling over provender is familiar to all. The growl and snarl of Coons in fight are well known, and the soft "err-err-err" of a young Coon begging for food, has been heard by all who know the Coon as a pet. But it has yet another note, one that has been the cause of much dispute. In the black woods, on still nights, I have often heard it, a long-drawn, tremulous "Whoo-oo-oo-oo." This is the "whicker." It is often passed for, or confounded with, the call of the screech owl. But I think one may tell them apart by the stronger and more squally quality that characterizes the sound of the quadruped; the bird's note is much softer and sweeter, as well as more often uttered.

Applying the definition of "song"—this long, variant sound, expressing joy, love, or vigour—the whicker of the Raccoon must be its song.

"A Coon makes a great deal of noise, and can be heard on a still night in the fall almost a mile. Their call is hard to describe, but it is shrill and quivering, and in timber or a cornfield, is hard to locate. . . .

"Talk about calls or noises. You could hear all you wanted, without having any owls mix in."[19]

Sanitation and Sunbath

The species has progressed but little along the paths of sanitation. Its dung is dropped anywhere, at any time, excepting while in the nest. Like Cow, Horse, and Bear, the Coon can void as it walks—is, in fact, a peripatetic defecator—but, owing to conditions, this bovine habit is not accompanied by bovine, much less equine, success. Its dung proclaims its near affinity with the Bears, being different chiefly in size from theirs.

As noted later, Bachman tells of his tame Coon that enjoyed a bucket of water thus:

"After playing for a short time in the water, it would commonly urinate in it, and then upset the pail."[20]

One of the marked and health-bestowing habits of the Coon is the sunbath. When the weather is bright and warm, the Coon, with his whole family, if they be big enough, climbs from his happy home in the hollow bole. They distribute themselves among the highest perches where best they can saturate their bodies with the heavenly rays. Sometimes back-up, often belly-up, sprawling and sun-roasting, the example is inspiring. But all too often, this, their only daylight appearance, has been the means of betraying their whereabouts to their chief enemy.

One of their choice perches for such sanitary treatment, is the deserted nest of a big bird. Cram says that the Raccoons use them also as outdoor dormitories when the weather is warm.

"Raccoons," he writes, "like most other climbing animals, make frequent use of the nests of hawks and crows to sleep in. At other times, they flatten themselves along the thick branch of a tree, their gray fur harmonizing admirably with the colour of the bark, or else they ascend to the tops of dense foliaged hemlocks and, circling their fat bodies completely around the main stem, doze away the time in comfort, supported by the numerous elastic branches about them, quite invisible from the ground. If a company of bluejays discover one in this position, there is sure to be a

[19] M. H. Douglas, Abbottsford, Wis., in Recreation, March, 1902, pp. 223–24.

[20] Q. N. A., II, p. 79.

Plate XXXVII Raccoon - poses & details by E.T.S.

tremendous racket right away, their shrill voices jarring the quiet of the tree-tops, like an alarm clock set to awaken the Coon from his slumbers."[21]

Food—A Long List

The Raccoon is quite omnivorous. Frogs, fish, flesh, fowl, eggs, reptiles, insects, shell-fish, fruit, nuts, grain, vegetables, and sweets are acceptable fare with him; not equally so, but all welcome at all times.

It may occasionally rob the nest of woodpecker, Squirrel, or other tree-dweller, but such must not be considered its normal habit of life. By far the greatest bulk of its food is taken on or near the ground.

In a wild state, the summer-long main support of the Coon is frogs. In catching them by night, it is singularly expert, and when the frog takes refuge in the muddy bottom, the Coon, with wonderfully dexterous, tactile fingers, gropes after it. Of course, it cannot smell them under water, or see them in the mud. Leaving the enterprise entirely to its paws, its eyes may scan the woods and shores in a vacant way, but its mind is in touch with its finger-tips, and the frog that escapes them must indeed be worthy to live, and father a superior race.

The "little Bear with the long tail," as Kennicott calls him, neglects no food opportunity. He does not call them calories and vitamines, but he uses them as though he knew all about food values. "In summer, frogs often form a large portion of its food, when some species leave the water and therefore are easily caught. Insects are eaten to some extent, as are slugs and snails."[22]

As Merriam says: "They overturn stones, and catch the crayfish that lurk beneath, and also gather the fresh-water mussels (*Unio* and *Anodon*) that live on sandy and muddy bottoms. They also catch and devour the hapless fish that chance to get detained in any of the little pools alongshore, but are unable to dive and pursue their prey under water, like the Otter and Mink."[23]

"In parts of the South where crayfish live in the levees and embankments, the Raccoon does good service in destroying these troublesome crustaceans."[24]

Pennant describes this animal as particularly fond of oysters, and says it "will watch the opening of the shell, dexterously put in its paw, and tear

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[21] Amer. Anim., p. 251.

[22] Quad. Ill., pp. 254–55.

[23] Mamm. Adir., 1884, pp. 91–92.

[24] A. K. Fisher, Yearbook, Dept. Agri., 1908, p. 192.

out the contents; sometimes the oyster suddenly closes, catches the thief, and detains it till drowned by the return of the tide."[25]

H. B. Warren, in his "Enemies of Poultry,"[26] assembles many testimonies of farmers, to show that the Raccoon not only kills poultry at times, but is a persistent fisherman, and very successful where shallow water leaves trout, etc., more or less at his mercy, in pools that represent the low tide of streams.

In the Southern States, its coat may change to a less substantial style, but its appetite for all nutritious dainties is the same. Bachman details its watching of "the soft-shelled turtle, when she is about to deposit her eggs, for which purpose she leaves the water and, crawling on to the white sand-bar, digs a hole and places them underneath the heated surface. Quickly does the rogue dig up the elastic ova, although ever so carefully covered, and appropriate them to his own use, notwithstanding the efforts of the luckless turtle to conceal them.

"Sometimes by the margin of a pond, shrouded, or crouched among tall weeds and grasses, Grimalkin-like, the Raccoon lies still as death, waiting with patience for some ill-fated duck that may come within his reach. No Negro on a plantation knows with more accuracy when the corn (maize) is juicy and ready for the connoisseur in roasting ears, and he does not require the aid of fire to improve its flavour, but attacks it more voraciously than the Squirrel or the blackbird, and is the last to quit the cornfield . . . and although it generally visits the cornfields at night, sometimes feeds on the green corn during the day; we have seen it thus employed during the heat of summer."[27]

Although the frog-pond and the corn-patch supply its choicest foods, the Coon is not averse to a fat fowl. Some individuals, indeed, seem to give way to the chicken habit, and riot in the henhouse night after night, killing first one fowl and then a dozen at a time, until they fall into the power of the barn-fowl's proper guardian—a case of which is detailed at the end of this Life.

These, however, are abnormal individuals and are not to be considered representative of the race. It is possible that, like most Lords of the Forest, its principal revenue is derived from Mice, which are available when frogs and fruit are not.

Summing up its dietary, there is nothing in it, except occasional thefts of corn and fowl, to blacklist this creature on the farm book; and these little

[25] Arctic Zool., 1784, I, p. 70.

[26] Penn. Legis., 1897, II, pp. 476–84.

[27] Q. N. A., II, pp. 76–78.

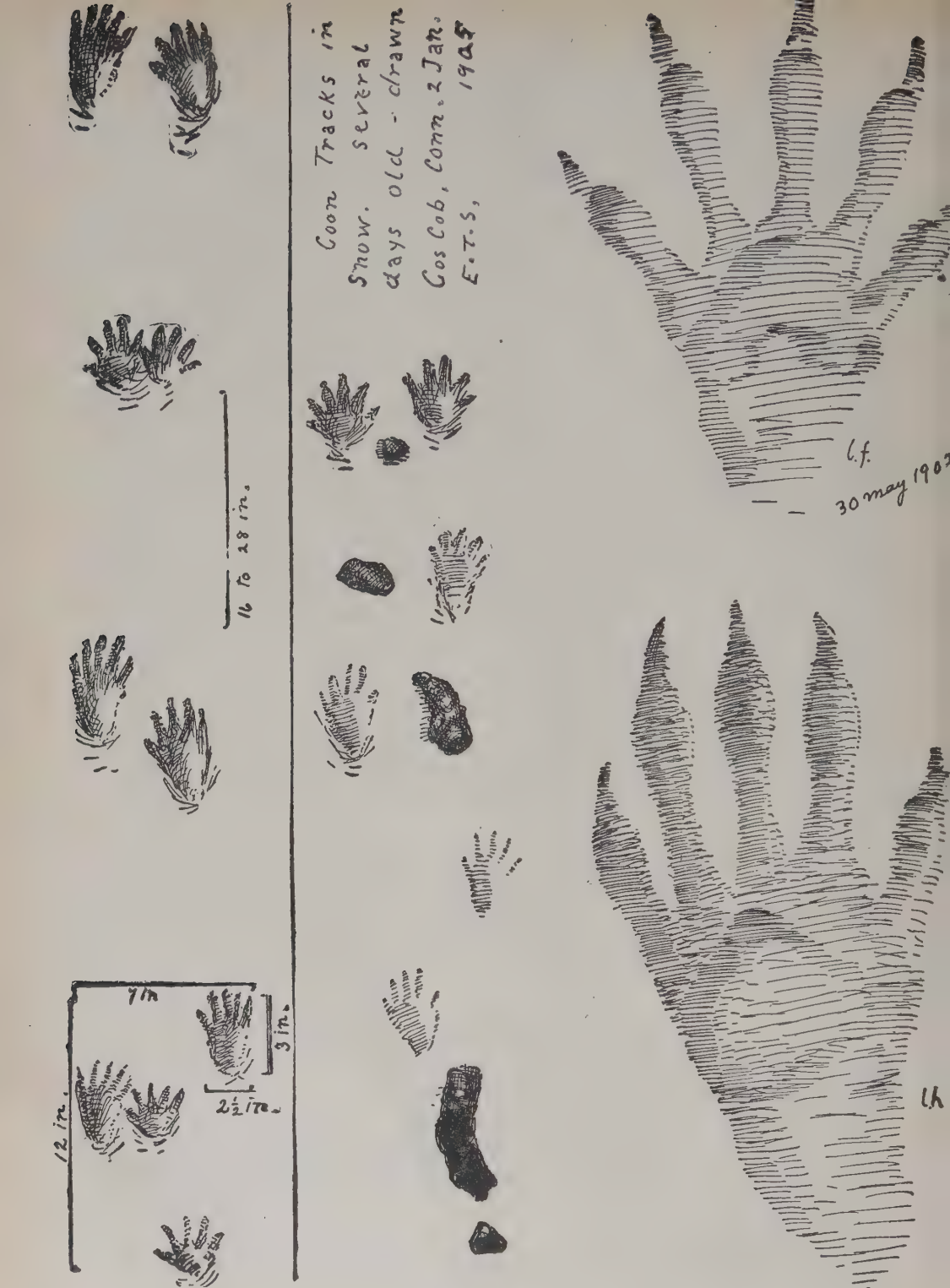

PLATE XXXVIII.—TRACKS OF RACCOON

The two large tracks on the right are left front and left hind of a large individual; they are natural size.

The series on the left was made by a large Raccoon running through the snow.

The middle series is part of this and shows where the creature walked when he should have stood still.

sins are so completely offset by its usefulness as a fur-bearer and beast of the chase, that most persons are glad to hear that the Coon is spreading, if not actually increasing, in America.

Den and Mating

The ideal den of this creature is some hollow branch high up in a large tree that is fully exposed to the sun. But Coon ideals are as scarce as those of man, and next choice is any available hole in a standing tree or tall stub. Failing this, it will use any hollow trunk it can find, preferably standing, but not to be despised when down, and it will even rest content with a cranny in a cliff. According to Kennicott, though "it never digs for itself . . . it will occupy the deserted burrows of other animals."[28]

The den is not only the nursery; it is the year-round home of the family. There seems little doubt that, like some other species, the Coon maintains a central home-den and several hunting lodges scattered in convenient proximity to favourite and remote feeding grounds, each to be used as occasion seems to warrant.

All the evidence there is goes to show that the Raccoon is a monogamous animal.

The mating takes place in midwinter. Dr. Clyde Fisher, of the American Museum of Natural History, writes me: "When I was a boy in western Ohio, I used to hunt Coons a great deal, and it was then the prevailing belief among my companions, both old and young, that the mating occurred in *February*. In confirmation of this, I saw a pair of Raccoons in captivity in the Central Park Menagerie, New York City, copulating on February 24, 1920. These Coons were in good condition for animals in captivity, and this was without doubt a real, complete sexual act, and not mere play as sometimes engaged in by animals."[29]

L. S. Russell, who is carrying on a fur ranch stocked with Coons, says that the mating takes place "in January or February, but the males should be with them in the early part of the winter.

"The period of gestation is 63 days. . . . They should be separated 3 or 4 weeks before the young are born, and given a little better food so they will be able to take care of the young."[30]

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[28] Quad. Ill., p. 255.

[29] Personal letter, March 21, 1925.

[30] Hunter-Trader-Trapper, Nov., 1924, p. 46.

Young and Family Life

The young are born in April or early May, varying somewhat with the latitude, those in the north being later. They number from 3 to 6, 4 being usual.

The pet Raccoon kept by M. H. Douglas of Abbottsford, Wis., produced young when she herself was but one year old.[31]

The home life of the Coon family is nearly ideal. I think, but am not sure, that the father continues to form one of the circle, and to some extent, helps in rearing the brood.

L. S. Russell, of the Coon ranch, does not accept this view, but says: "Keep males away when the young come, as they will oftentimes kill them. I have had males reach through the fence and kill the young after they were large enough to get out and around the yards."[32]

The fact that this takes place in captivity, however, does not prove it to be the rule under natural conditions.

During May, the little ones stay home and are nourished only with milk. In late June, they are one-third grown, and begin to sit outside the den on bright days, enjoying their sunbath, but ready to seek the home nest on the slightest hint of danger.

A charming picture of young Coon life in Texas is supplied by Vernon Bailey. He says:

"While watching for Fox-squirrels one morning [June 6] in the heavily timbered bottoms, I heard a scratching sound from an old cypress in the edge of the swamp near by, followed by a loud splash. A young Coon, less than half grown, had fallen from the tree into the water. At the sound, the old Coon and 2 more young ones came out of a hollow some 30 feet up in the trunk, and climbed down to near the bottom of the tree. They came down the tree slowly but steadily, head-first, as a Squirrel would have done, with the hind feet reversed and slightly divergent.

"When the old Coon saw the young one climb out of the water upon the tree trunk, she turned about and ascended the trunk, followed by the 3 young. The one that had fallen, besides being very wet, was slightly hurt and climbed with difficulty. When halfway up, he stopped on a limb to rest, and began whimpering and crying.

"The mother had already reached the hole, but, on hearing his cries, turned about, and climbed down to him. Taking a good hold of the back

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[31] Recreation, Mar., 1902, pp. 223–24.

[32] Hunter-Trader-Trapper, Nov., 1924, p. 46.

of his neck and placing him between her fore legs, so that he, too, could climb, she marched him up the tree and into the hollow."[33]

In mid-June, about Toronto, I found the young still suckling.

Whether the parents ever bring home food to the young is not known.

In July, the young begin to accompany the mother, or possibly both parents, in nightly excursions to the edges of swamps and streams, where they learn the rudiments of frog-hunting, crayfish-catching, and many other pursuits that make their life.

In August—the Green-corn Moon—the mother Coon will lead them to the fields where grow the milk-ear rows, and they revel in a feast that is to them what honey is to Bears.

A lively scene took place one mid-August night, outside my shanty in the Adirondacks. Two Coon families had met at a certain delectable fishing pool, which was responsible indeed for my presence. Their meeting was accidental and unfortunate, if one might judge by the row that followed; for they squabbled, scolded, and fought for half the night. As nearly as could be ascertained in the gloom, there were 2 old ones in charge of one family, and but one caring for the other.

A hint of the "old man's" habits is given us by Kennicott. He says: "The males, in summer, frequently change their place of abode, wandering considerable distances on the prairie, and finding temporary homes in the deserted burrows of the Badger, Wolf, or Skunk. They return to the woods, however, before winter, and though I am informed that one has been found hibernating under the long prairie grass, several miles from any woods, it had doubtless been surprised in that situation by sudden cold, and forced to take shelter.[34]

All through autumn and winter, the family life continues; not even the mating season seems to mar their good-fellowship. Merriam says: "It is unusual to find a Raccoon alone, for they commonly live and travel in small companies, consisting of the several members of a single family. They do not return to the same nest every morning, but often make little excursions in various directions, being gone several days at a time, and taking refuge, about daylight, in any convenient arboreal shelter.

. . . . . .

"In tracking Raccoons upon the crust, I have sometimes observed a family to separate and go in different directions, spending the day in different trees, to come together again on the night following."[35]

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[33] N. A. F., No. 25, 1905, p. 194.

[34] Quad. Ill., p. 255.

[35] Mamm. Adir., p. 94.

So far as I have been able to determine, the young Coons stay with the old folks as long as the latter allow it; and these make their full-grown offspring welcome until their quarters are needed by the new family, which arrives with commendable regularity as soon as the late April showers and the greening hills proclaim that now and truly is the world astir with spring.

Autumn is a time of bounty, when all the wild things batten; but spring, lovely spring, is at best a bright creature of fair promises—a condition which the Coon-folk realize to their cost. John Burroughs says: "In March that brief summary of a Bear, the Raccoon, comes out of his den in the ledges, and leaves his sharp digitigrade track upon the snow—travelling not unfrequently in pairs—a lean, hungry couple, bent on pillage and plunder. They have an unenviable time of it—feasting in the summer and fall, hibernating in winter, and starving in spring. In April, I have found the young of the previous year creeping about the fields, so reduced by starvation as to be quite helpless, and offering no resistance to my taking them up by the tail, and carrying them home."[36]

Pet Coons

The old Raccoon is sullen, dangerous, and untamable, if kept captive; but the young, if taken at an early age—that is, before they have begun to hunt for themselves—make, as Merriam says, "intelligent and interesting pets; being easily tamed and evincing considerable affection for their master.

"But they cannot be allowed their liberty like tame Skunks, because of their innate propensity for mischief. If not closely watched, they will slyly enter the house through some open door or window, and are liable to do considerable damage, for their natural curiosity prompts them to examine everything within reach, and anything out of reach of a 'Coon' must be inaccessible indeed. They invariably manifest an insatiate desire to investigate the pantry shelves and rarely neglect to taste every edible thing that happens to be there. They have a special penchant for sweetmeats; and greedily devour preserves, honey, molasses, sugar, pies, and cakes, and even bread, butter, lard, milk, etc., are by no means disregarded. They remove the covers from jars and pails, and uncork bottles with as much ease and facility, apparently as if they had been instructed in this art from earliest infancy. Doors that latch, as they do in most old country houses, are soon opened, even by unsophisticated Coons, and it takes them but a short time to acquire the method of opening knob doors. Their fore paws are employed as hands, and can be put to almost as great a variety of

[36] Squirrels and Other Fur-bearers, p. 94.

PLATE XXXIX.—BLACK TRACKS OF RACCOON (LIFE SIZE)
Made by driving the animal over fresh black paint then across a clean sheet of soft paper. Secured by Mrs. Grace G. Seton

uses as those of a Monkey—which animal they further resemble in the propensity for mischief-making."[37]

M. H. Douglas of Abbotsford, Wis., gives an interesting sketch of his pet Coon as follows: "I remember at one time, when a boy, having a pet Coon, caught when quite young, the mother having been killed a few days before.

"In a few weeks after being captured, Cooney had the run of the farm; and during the time she remained with us, never took an egg, or killed a chicken; although for mischief I never saw anything equal her.

"Several times in the fall, I took her miles in the woods. She would follow me anywhere like a Dog. I would try to leave her, and get back home; but every time she would come humping along a little later. In November, she hibernated under a beam in a haymow, and would only show herself a little on mild days, eat a little, and go back. In March, we had a warm rain, and she left, never to come back, although she came back in August with a family, which she raised close to the farm. She was so tame that she would bring them almost to the house at night, and could often be seen. . . . Later in the fall, the family fell the victim of Coon Dogs."[38]

Bachman supplies the following notes on a pet Raccoon.

"When it first came into our possession, it was about one-third grown. By kind treatment, it soon became very docile, but from its well-known mischievous propensities, we always kept it chained.

"It is truly omnivorous; never refusing anything eatable, vegetable, or animal, cooked or uncooked, all was devoured with equal avidity. Of some articles, however, it seemed particularly fond: as sugar, honey, chestnuts, fish and poultry. The animal would become almost frantic when either of the two first was placed near it, but beyond its reach. No means would be left untried to obtain the dainty morsel. It would rush forward as far as the chain permitted, and stretch out a fore paw toward the object of its wishes to its utmost extent, which failing to reach it, the other was extended; again disappointed, the hind limbs were tried in succession, by which there was a nearer approach to the food, on account of the animal being chained by the neck.

"On being offered food when hungry, or roused up suddenly from any cause, or when in active play, the eye was of a lustrous green, changing apparently the whole countenance.

"It had a strong propensity to roll food and other things under its paws; segars in particular, especially when lighted. We have observed a similar propensity in young Bears.

[37] Mamm. Adir., p. 93.

[38] Recreation, March, 1902, pp. 223–24.

"On placing a pail of water within its reach, it ran to it, and after drinking, would examine the contents to the bottom with the fore paws, seemingly expecting to find some fish or frog. If anything was found, it was speedily brought to the surface and scrutinized. We have seen it throw chips, bits of china and pebbles, etc., into the pail, and then fish them out for amusement, but never saw it put a particle of its food in to soak, except in a few instances when it threw in hard corn; but we do not think it was for this purpose.

"After playing for a short time in the water, it would commonly urinate in it, and then upset the pail.

"We gave it a fish weighing 2 pounds. The Raccoon turned it in all directions in search of a convenient point of attack. The mouth, nose, fins, vent, etc., were tried. At length, an opening was made at the vent, into which a paw was deeply inserted; the intestines were withdrawn, and eaten with avidity. At the same time, an attempt was made to insert the other paw into the mouth of the fish to meet its fellow. This disposition to use the paws in concert, was shown in almost every action, sometimes in a very ludicrous manner. On giving the animal a jug, one paw would be inserted in the aperture, and a hundred twists and turns would be made to join its fellow on the outside.

"After devouring as much of the fish as it wished, it placed the paws on the remainder and lay down to doze until hunger returned, watching the favourite food, and growling at any animal which happened to pass near it. By degrees, this propensity to defend its food passed off, and it would allow the Dog or Fox to partake of it freely. We placed a half-grown Fox within its reach; the Raccoon instantly grasped it with its legs and paws, and commenced a close examination. It thrust its pointed nose in the ear of the Fox to the very bottom, smelling and snuffing as if determined to find out the nature of the animal. During this time, it showed no disposition to injure the Fox.

"The Raccoon can scent an object for some distance with accuracy. We suffered ours to go loose on one occasion, when it made directly for some small Marmots confined in a cage in another room.

"Our pet Raccoon, whose habits we are relating, evinced a singular propensity to listen to things at a distance, however many persons were around him, even though he might be at the moment eating a frog, of which food he was very fond. He would apparently hear some distant noise, then raise his head and continue listening, seeming every moment more absorbed; at last he would suddenly run and hide himself in his burrow."[39]

[39] Q. N. A., II, pp. 79–80.

The Coon and His Foes

The Coon is a desperate fighter. I have seen one beat off two large hounds, each of which was more than double his weight; and saw another defeat 3 Dogs—a terrier and 2 hounds. A Bedlington terrier, a famous fighting Dog in Toronto, supposed to be 25 pounds weight, was said to have reached a final pitch of war-glory when, single-handed, he killed a full-grown Coon whose weight was almost certainly much less than his own. Had they been of equal weight, and in a fair fight, I doubt whether the Dog would have had any show of winning.

"The Coon," says John Burroughs, "is probably the most courageous creature among our familiar wild animals. Whoever saw a Coon show the white feather? He will face any odds with perfect composure. I have seen a Coon upon the ground, beset by 4 men and 2 Dogs, and never for a moment losing his presence of mind or showing a sign of fear. The Raccoon is clear grit."[40] Again he says: "The Coon is very tenacious of life, and like the Badger, will always whip a Dog of its own size and weight."[41]

Man is, of course, its worst enemy, and yet, in some localities, the species seems to have increased in recent years; due partly, no doubt, to the abundant food supply furnished by the settlers' crops, and partly to the destruction of enemies that prey upon it.

The most formidable of these last, perhaps, is the Fisher. Reference to the Life of that animal shows that the present species increases in the northern region as the Fisher is exterminated by the trapper.

His Way of Life

The Coon is a hibernator in the same limited sense that the Bear and the Skunk are. He goes into a sort of cold-sleep when the weather gets too chilly for his comfort, and probably arouses to active life as soon as the thermometer is well above zero. He never assumes the death-like torpor of Woodchuck, Ground-squirrel, or Jumping-mouse.

So strictly is this hibernation dependent on temperature that in the Southern States, he never enters the winter sleep at all. In the northern part of the range, he is dead to the world for at least three months. Thus, in the Red River Valley, the sleep lasts from mid-November to early March. In the latitude of New York, this is shortened at both ends by several weeks.

When the back of winter is broken, and the fierce frosts are over, the

[40] Squirrels and Other Fur-bearers, p. 139.

[41] As above, p. 95.

Raccoon once more begins his season of active life, although ever ready to resume the cold-sleep if the return of winter weather should render it desirable. As the ground is still covered with snow and the Coon does not store up food, he is hard put for a time, and draws freely on the reserves that are afforded by his fat. These are usually exhausted before Dame Nature again provides his daily bread, so that, as we have seen, the spring Coon is a very lean beast.

He is strictly nocturnal, if any animal ever is; the darkest hours of night are his favourite time for prowling, which, nevertheless, does not prevent enterprising reformers of the race occasionally setting forth on a diurnal excursion; for which they not uncommonly share the fate of unnumbered reformers, and win, without wearing, a martyr's crown.

My own experience, backed by most authority in print, inclined me to say that the Raccoon was always, and strictly, nocturnal. The rare exceptions that come to mind are of Coons lying out on a high sunning perch on bright mornings.

I was therefore surprised to read in C. B. Cory's "Mammals of Illinois and Wisconsin" (p. 393): "The Raccoon is largely nocturnal in its habits, but I have occasionally seen one wandering along the shores of ponds and streams in the daytime."

Although nesting and resting in trees, where he moves about with the slow caution of Possum and Bear, rather than the reckless agility of Marten and Squirrel, the Coon travels, hunts, and feeds almost exclusively on the ground. One might say, not only on the ground, but in the water, or at least the mud.

This nightly search for food in the mud under shallow water, has resulted in the remarkable habit he has of washing "the mud" from all food, still or wriggly—whether it be muddy or not.

Go on twenty different days to twenty different Coons, and offer them twenty different kinds of food, and each and every piece, wet or dry, clean or muddy, is at once taken to the water trough, and carefully washed; for which cleanly habit he has got his German name of "Wash-bear," (Waschbär) and the Latin name of "lotor."

His nightly search, groping without smelling, in the mud, has suggested the means by which most Coons are trapped; viz., a steel trap hidden in the mud along a shore that, by the abundant tracks, is evidently the feeding ground of Coons.

Taking advantage of this, many trappers catch Coons by setting in the mud on some favourite frogging point. I shall never forget the sensation I had in my early days when, one morning, on going to a trap set

under water for Muskrat, I found, firmly held in it by one paw, a huge and savage-looking Raccoon.

If necessary to reach some desirable food, or to escape from an undesirable caller, the Coon will swim fearlessly and well, but ordinarily is not fond of water in which he cannot comfortably wade.

Trapping

"Cute as a Coon" is an old adage that is supposed to refer to the fox-like cunning of the old Raccoon. My own experience does not justify this. I have caught several in very obvious traps that a Fox would have scoffed at. Merriam says of a treed Coon: "If the tree is too large to be easily felled, a trap set at its foot, and baited with a bit of toasted codfish or an ear of corn, is pretty sure to secure him before the next morning."[42]

I have more than once heard of a trick by which hunters secure a Coon that has gone up a tree too large to be cut down, and too dense of leafage to be searched out with torch and keenest eyes. If straw is handy, they make a band of it, and tie it around the tree as high up as they can reach. Over this the Coon will not come; so, next morning, the hunter returns with rifle, and picks him off out of the topmost branches. When no straw is at hand, a dummy made of surplus clothing is sometimes left, and as effectually guards the prisoner.

A Coon travelling through the woods, always runs along every fallen log that lies in the line of his travels. This fact is often taken advantage of in trapping. Two sticks are crossed in the middle of a log so that the creature must jump at that place, and a trap is hidden at each side of the jump to make sure of him coming or going.

As a runner, he takes low rank. I never saw but one running before the hounds in daylight, and his speed seemed barely half of theirs. Moreover, in many nights cooning, I never knew one of these animals to run more than a quarter of a mile before treeing.

A much more experienced Coon hunter, however, has a very different story to tell. Leon F. Whitney of Northampton, Mass., writes me: "The hunt that I told you about, opened my eyes to the distance, and with what speed, a Coon can run. My Dog is a very fast one, and with a good nose, and true blue on Coon. Had we not seen the Coon once and heard him go by again, I should have agreed that it was a Fox or a Deer, since he circled out of hearing twice and returned and eventually treed out of hearing again. There were no hills to obscure the sound. We knew the direction

[42] Mamm. Adir., p. 94.

from the way my second Dog returned (she is just learning to hunt Coon). They were running for 2½ hours, and the last time we heard the Coon, the Dog was not over 100 yards from her, and they certainly ran 35 minutes after that.

"I have seen Dogs work 3 or 4 hours on an old track, but this was fresh, with the Coon on the run, and we estimated that they ran about 5 miles."[43]

A Glorious Exploit

In the June of 1888, I went to stay with my uncle, W. Schreiber, at Springfield-on-the-Credit, Ont. They told me, on arriving, that something had been raiding the henhouse at night. Many chickens were missing, and finally the hens were refusing to enter the place, preferring to roost in the near trees. I set a steel trap baited with chicken meat, and also sprinkled the floor with fine dust before leaving.

Next morning, the trap was untouched, but there in the dust were clearly the tracks of a Coon that had come in, sniffed at the trap, then gone away.

The next night, I laid a different snare. The door opened outward. I propped it ajar with a stick to which was fastened a little platform. Then, against the door outside, I set a heavy pole. The platform was so fixed that any animal walking on it would make the stick fall; then the pressure of the pole would promptly and firmly close the door.

Next morning (June 10th) to our delight, shared possibly by the chickens in the trees, the door was tight shut, and, crouching in one of the hen boxes, with green eyes aglare, was an old she-Coon, looking desperately ashamed of herself.

Then we did something which we were ashamed of before it was over. We took that Coon (she weighed exactly 10 pounds), and turned her loose in an open part of the woods, with 3 Coon Dogs yelping around. The Dogs—mongrels with a dash of hound—weighed about 40 pounds each.

Ere now I had been present when Coons were killed by Dogs. But those early occasions were by night, when little or nothing could be seen of the fight. This was in clear sunlight, and the way that brave and desperate little Coon received her rabble of foes began to thrill me. She lay back against a bank and waited for each valiant Dog to approach, then clutched him with her arms about his neck and her legs about his body, while she mangled his features with swift, persistent jaws. When a Dog seized the back of her neck, she turned in her hide, and gashed and ripped his ears till he yelled and quit. It was astounding, heroic. She thoroughly

[43] Personal letter, Dec. 4, 1923.

cowed the three bellowing brutes, backed though they were by half-a-dozen men, and was able to spring away, and up the nearest tree.

I had forgotten or forgiven the stolen chickens. My sympathies now were all with the brave little Coon. But a rifle shot rang, the Coon fell dying. The Dogs, in new, cheap courage, vented their poor wrath on the body.

We found out now, too late, that she had little ones dependent on her. She had needed those chickens to nourish them. We never found the little ones. I do not like to think about what befell them.

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LIFE XXIV—THE COATIMUNDI

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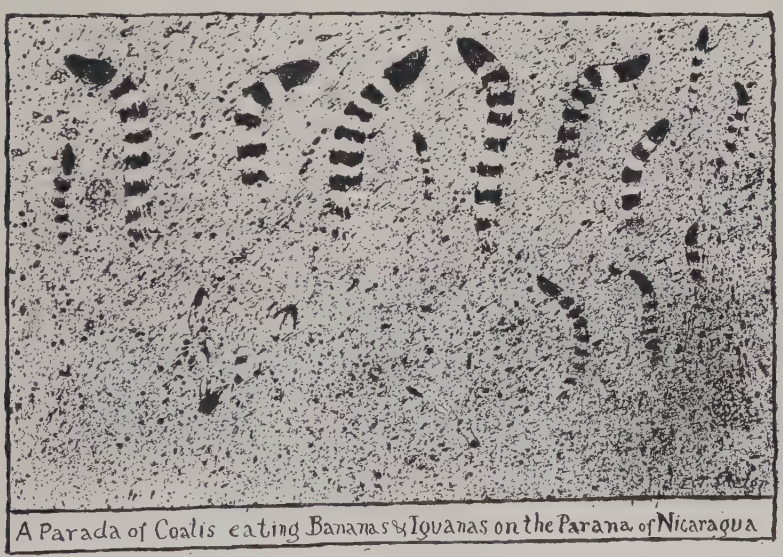

A Parada of Coatis eating Bananas & Iguanas on the Parana of Nicaragua

Cuati, Coati, Coati-mundi, Coati-mondé, Pisote, Nasua, or Hog-nosed Coon

Nasua narica (Linnæus)

(L. *Nasua*, from *nasus*, the nose, noting its remarkable snout; L. *narica*, from *naris*, the nostril)

[*Viverra*] *narica* Linnæus, 1766, Syst. Nat., ed. 12, p. 64.
Nasua narica True, 1885, Proc. U. S. Nat. Mus., Vol. 7 (1884), p. 608.

Type Locality—State of Vera Cruz, Mexico.

The genus *Nasua* Storr (1780) comprises medium-sized animals, that is, Raccoons which differ chiefly from the true Raccoons, in having a prolonged snout-like muzzle, long tapering tail, and harsh fur. The tooth formula is the same.

Names

"This [Cuati] is the name which the Guaranese give to this singular animal, which is *sui generis*, and is only met in the woods of Paraguay, and as far as the river La Plata."[1]

Later, referring to solitary males, Azara says: "It is asserted that there are solitary *Cuatis*, which are called *Coatimondé*, many persons believing they are a distinct species from that which is simply denominated *Cuati;* for they say that the *Mondé* is solitary, and of larger dimensions: but I have no doubt there is but one species, the difference in magnitude depending on age and sex."[2]

Berlandier speaks of the Coati, *Nasua fusca*, as common in the State of Tamaulipas, one in his possession having been caught in the "Sierra de Tamaulipas del Norte," where it is called *apache*, sometimes *mapach*.[3]

Size. A large ♂ from Escuinapa, Mexico (Am. Mus., No. 14331), measured on the dry skin: Total length, 53 in. (1340 mm.); tail, $24\frac{1}{2}$ in. (620 mm.); hind foot, $3\frac{3}{4}$ in. (95 mm.).

The female is smaller.

Colour. In general, warm wood-brown, shaded into dull white beneath.

[1] Azara, p. 318.

[2] As above, pp. 322–23.

[3] Baird, Mamm. Mex. Bd., 1859, p. 22.

Peppered blackish on back, and tinged with yellow on neck and shoulders Belly, pale warm brown, more or less peppered with dark hairs that have light tips. On throat, breast, and inside fore legs, the warm yellow-brown underfur is covered with long whitish hairs through which it is visible. A dark mask of pale umber across eyes. White spot above each eye, one under each eye, another behind eye. Muzzle, chin, and throat, white. Paws, blackish-brown or umber. Tail, coarse, yellowish brown, with dark brown tip; in this case, not obviously ringed.

Another ♂, from Mazatlan, is warmer in general colour; tail, brownish ochre with 7 faint rings and a dark brown tip.

Some have 2 white spots behind the eye.

Sexes alike.

Races

The following forms have been recognized:

narica Linnæus, the typical form. T. l., State of Vera Cruz.

nelsoni Merriam, a very small form; tail short. T. l., Cozumel Id., Yucatan, Mexico.

molaris Merriam, like *narica*, but gray of face more restricted, tail longer. T. l., Manzanillo, Colima, Mexico.

bullata Allen, a dark form. T. l., Pozo Azul, Pirris Province, Costa Rica.

pallida Allen, a pale form. T. l., Sierra Nevada, Chihuahua, Mexico.

panamensis Allen, similar to *bullata*, but smaller. T. l., Boqueron, Chiriquí, Panama.

yucatanica Allen, a small form of pale colour. T. l., Chichenitza, Yucatan, Mexico.

Range

The Coati is a south and central American species, reaching northward to northern Mexico, and sporadically to southern Texas, New Mexico, and Arizona. As already noted, according to Berlandier, it is common in the State of Tamaulipas. The following are all the available United States records:

"A specimen of this long-nosed, long-tailed, coon-like animal [*Nasua narica yucatanica* Allen] in the National Museum, collected in 1877 at Brownsville, by the late Dr. J. C. Merrill, furnishes apparently the only record for the State. As *Nasuas* occur over most of Mexico, up to near the

MAP IV.—RANGES OF NASUA OR COATI, AND OF BADGER
By E. T. Seton, with assistance of the Biological Survey
The crosses in Arizona and New Mexico are Coati records.

border of the United States, other records along the Rio Grande may be expected."[4]

"Three or four days ago, a lady described to me an animal which had been killed in the Chiricahua Mountains, and of which she had seen the skin, which was undoubtedly a Coati. This is the only record I have personally heard of for Arizona, though it should occur here occasionally."[5]

"My record of the *Nasua* in New Mexico was based on an animal killed by a ranchman in the southeastern corner of the State, and described so accurately that we consider the record perfectly reliable."[6]

Life History

The Coati was named by Linnæus in 1766, but practically nothing was known of its life and personality, until about 1800, when Azara described the creature as he found it in Paraguay.

Now that I gather up the recorded fragments of its life, I am disappointed to realize that little has been added since Azara's time and writing. This life is little more than a rearrangement of his scattered observations.

Referring to a captive, the distinguished Spaniard says: "It passes the day in pacing to and fro, as far as its chain will permit, and ceases only that it may eat and drink; it does not, however, turn like the Dog and most other animals, but raises its fore paws, and whirls about upon its hind heels."[7]

This habit is, doubtless, a reflex of their usual footing—the Dog on the ground, the Coati on a high narrow perch. It is interesting to note that the Mountain Goat commonly makes the narrow-perch turn.

A young female in my possession for a few weeks, was so eternally restless that she never ceased pacing up and down; so that attempts to photograph her were most exasperating, and, of course, resulted in countless spoiled plates.

The Tail

One of the chief peculiarities of the Coati, is his tail. It is remarkably long, 15 to 20 inches, or as long as his head and body together. It has no particular function that is obvious. In a country where prehensile tails are the rule among the tree-climbers, the Coati is unequipped with any measure of prehensility in this fifth limb.

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[4] Bailey, N. A. F., 25, 1905, p. 192.

[5] Chas. T. Vorhies, of Tucson, Ariz. Personal letter, March 4, 1924.

[6] Vernon Bailey, in a letter to Charles T. Vorhies, June 25, 1925.

[7] Azara, p. 319.

D. G. Elliott is responsible for the statement that "the long tail, though not prehensile, is sometimes used to bring objects within reach of its paws."[8] Which, however, is far from implying the power to swing by its tail.

It is probable that on the high limbs of trees, the tail serves the Coati as a balancing pole. When the animal is on the ground, the characteristic position of the tail is straight up, with a little crook near the top. Up and down the cage he goes, or round and round his chain post, ever carrying aloft the strange black-and-gray-ringed tail, the badge and standard of his race. Whatever other purpose it serves, this is sure: it is his totem pole, the blazonment to his own people afar that hereabouts at the foot of this tall painted pole, there stalks and lives a Coati. If you be of his tribe, approach in due respect.

Above the grass it looms, when he walks on earth. Among the trees, its rigid rings are unlike any other live thing, and are seen afar. In the menagerie, it is a safe, inviting handle for the keeper who would lift the Coati; and, like the banner pole of a disarmed Skunk, is so obviously to the keeper's advantage, that one wonders much about the Darwin dictum. If any animal has acquired any trait, or part, of benefit only to another animal, the theory of evolution must fall.

This woodland barber-pole looms large in the life and thought of the Coati, and, as often happens, becomes associated with some vicious habit. A young female that I had in my zoo for a few weeks, had lost a portion of her tail—the top, maybe only a few inches—a couple of short links. On this, she expended far too much time and thought, licking and mumbling it so that it continued raw and, I doubt not, itchy.

Buffon must have observed a similar propensity, for, according to Azara, he adds to his general description of the Coati: "that it is in the habit of eating the tip of its tail; but," says Azara, "I have seen more than 200 Cuatis, wild and domestic, all of which had their tails entire. From this alleged fact, and the assertion that Monkeys and other animals do the same, he infers generally that the sense of feeling is weak in those parts of the body which are removed from the centre of sensation, and are so much the more obtuse as the distance is greater and the part small."[9]

This last imaginative and truly Buffonian touch brought down the wrath of Azara, who scornfully refuses to give it any credence. But we must remember that this is one of the thousand theoretical and fanciful remarks that Buffon scattered through his work, inviting hostile criticism—many times successfully destructive criticism—but they yet had the merit

[8] Mamm. Mid. Amer., 1904, II, p. 494.

[9] Azara, p. 324.

of making men think, and were often so profoundly philosophical that Buffon was, in some sort, a founder of the evolutionary school.

Food

In reference to the food of this quaint product of the great hot forests, Azara says:

"The habits of the Fox are attributed to this animal; but its want of agility, and its elongated muzzle, manifest it is quite incapable of preying upon animals, and prove its nature to be widely different; at the utmost, it can only surprise birds on the nest, and eat their eggs and young. I introduced some Mice to a domesticated one, and it took not the least notice of them: I saw it, however, catch some chickens which passed near, and kill them without eating any part, save a small portion near the collar-bone; so that no doubt remains on my mind, that the Coatimundi subsists chiefly on fruit and insects, and that it only occasionally hunts birds, etc."[10]

Again, "It eats bread, sugar-cane, flesh, both raw and cooked, all sorts of fruits, and is quite omnivorous. In the act of feeding, it places its fore paws upon its victuals, and, steadying them with its left, hollows or tears them with its right and devours the fragments, without using its paws to convey them to its mouth. If either man or Dog approaches, it snaps up its food, and removes it as far as its chain will allow. It drinks frequently, repeating its lappings more rapidly than the Dog, turning its muzzle high up in the air to avoid wetting it."[11]

Thomas Belt says of this animal, as he saw it on a certain trail in Nicaragua: "One day, when riding down the path, I came upon a pack of Pisotes (*Nasua fusca*, Desm.), a raccoon-like animal, that ascends all the small trees, searching for birds' nests and fruits. There were not less than fifty in the pack I saw, and nothing seemed likely to escape their search in the track they were travelling. Sometimes solitary specimens of the Pisote are met with, hunting alone in the forest. I once saw one near Juigalpa, ascending tree after tree, and climbing every branch, apparently in search of birds' nests. They are very fond of eggs; and the tame ones, which are often kept as pets, play havoc among the poultry when they get loose. They are about the size of a Hare, with a taper snout, strong tusks, a thick, hairy coat, and bushy tail."[12]

Referring to the edibility of the abundant iguanas, Belt says: "The raccoon-like 'Pisote' is also fond of them, but cannot so easily catch them.

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[10] Azara, p. 318.

[11] As above, p. 319.

[12] The Naturalist in Nicaragua, 1888, pp. 120–21, 1st Edition, 1874.

He has to climb every tree, and then, unless he can surprise them asleep, they drop from the branch to the ground, and scuttle off to another tree. I once saw a solitary 'Pisote' hunting for iguanas amongst some bushes near the lake where they were very numerous, but during the quarter of an hour that I watched him, he never caught one. It was like the game of 'Puss in the Corner.' He would ascend a small tree on which there were several; but down they would drop when he nearly reached them, and rush off to another tree. Master 'Pisote,' however, seemed to take all the disappointments with the greatest coolness, and continued the pursuit unflaggingly. Doubtless, experience had taught him that his perseverance would ultimately be rewarded; that, sooner or later, he would surprise a corpulent iguana fast asleep on some branch, and too late to drop from his resting place. In the forest, I always saw the 'Pisote' hunting in large bands, from which an iguana would have small chance of escape, for some were searching along the ground whilst others ranged over the branches of the trees."[13]

To this Goldman adds: "In Panama, the iguanas congregate in numbers to feed on the flowers of certain trees, especially on erythrina-like species at Gatun; at such times, some of them would not be likely to escape the sudden attack of a party of Pisotes.

"Stomachs examined by me contained fruit pulp only, but they probably have a diversified diet."[14]

My own captive was very fond of ants, ant pupæ (these she rooted out of the ground, hog-fashion), green caterpillars, or inchworms, champing them up with much action and loud mouthy noises. Her favourite foods, however, seemed to be roast chicken, apple, bananas, sugar, and raisins.

Mating and Young

The species is believed to pair, but the fact that it runs in troops suggests polygamy as a possibility. Azara says: "At the end of September, I found one carrying 5 young, destitute of hair, 3 of which were males and 2 females."[15] He records another female thus: "At the beginning of October, I procured 4 young from her, 3 of them males."[16] Later he says of the number of young: "I have found the number to be 4 and 5."[17]

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[13] Azara, p. 339.

[14] Mamm. Panama, p. 154.

[15] Azara, p. 322.

[16] As above, p. 322.

[17] As above, p. 325.

The time of mating, the courting ceremonies, vocal or otherwise, the place and kind of den, the details of raising the young, etc., are unrecorded.

Habits in General

A young female (*molaris*) was caught by a sailor on the east coast of northern Mexico, and came into the possession of William H. Carr of the American Museum. He loaned her to me, and I kept her in my menagerie for a few weeks, and made observations which, at least, corroborated those of Azara.

In coming down a tree, she usually came head first, but sometimes tail first. In habits, she was a mixture of Coon and Monkey, with not a little dash of Pig.

She used her long, sensitive nose exactly as a Pig does, rooting in the ground for seeds or worms, suggesting the name "Hog-nosed Coon."

The only vocal sound I heard her make, was a sort of squeak, sometimes repeated as a bird-like twitter, which usually expressed impatience. This agrees with Azara's account. He says of his captive: It "utters a shrill cry like a bird, to express its sense of hunger and inconvenience, differing only in the frequency and the greater or less force with which it is emitted."[18]

When offered a bowl of water, she always put her two fore paws in it, or if the day was hot, she walked through so as to cool all her feet.

Azara's remarks on its sanitary habits contain nothing of novelty, and yet are worth quoting because of the light they throw on the Spaniard's keenness of observation. He says: "It smells its hard and coagulated excrements as soon as it has voided them, scratching itself with the muzzle, fore paws, and hind feet."[19]

Discussing the senses of the species, Goldman says: "Their sense of smell is keen, as shown by one at Gatun that, without offering to bite, would force his long snout into the spaces between my fingers in order to reach a nut held in my clenched hand; but if I extended my empty hand, clenched as before, he merely sniffed at it."[20]

"When searching for food," the same naturalist continues, "they carry their long tail high in the air, and move at a rather rapid pace, running here and there, pausing a moment to paw up the ground, or poke their long noses into likely places, and then hurrying on to overtake more advanced members of the troop. They also ascend trees in quest of food."[21]

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[18]Azara, p. 319.

[19]As above, p. 319.

[20]Mamm. Panama, p. 155.

[21]As above, p. 154.

As Pets

Azara says of Coatis in general: "They are easily reared in dwelling houses, but are always secured: for, when loose, they ramble about everywhere, and upset and break everything."[22] Goldman adds: "They are easily tamed, and make entertaining pets."[23]

Speaking of one he kept captive, Azara says: "I have seen it very playful with Cats and young Dogs, and sleeping in the embrace of these last."[24] To which he adds, in apparent contradiction: "It is most untractable, and not influenced by blows: and although it frequently amuses itself, and shows pleasure on being scratched, it takes no affection, nor shows a preference for any person or place."[25]

The female that I kept for some weeks was not only an amusing and playful pet, but very marked in her partialities. To some, she went quickly and spontaneously; others she resented, and if they touched her, would snap at their hands with her teeth. But never did she bite really to draw blood.

She was one of the most playful and kindliest animals I ever knew. She would stand on her hind legs and box with her front paws, climb a table, a wall, or a tree, and hang head downward, leaving her fore paws free for work or play.

William H. Carr, the owner of this animal, writes me that, although some observers have described the species as incurably vicious, "the several specimens that I have had, have proved to be just the opposite in temperament. Mr. W. Beebe tells me that the Guiana species, *Nasua nasua*, is also very tame and well mannered."[26]

From which we must infer that the careful and reliable Azara was observing either a specimen captured after it was full grown, or else that it was a cranky individual.

Herd Habits

According to Azara, "it is solitary, or goes in pairs and small bands; for two or three females with their offspring are in the habit of joining together. It climbs trees better than the Monkey, without using its tail; and it is said to be an amusing sight to see a troop of these creatures actually

[22]Azara, p. 318.

[23]Mamm. Panama, p. 155.

[24]Azara, p. 319.

[25]As above, pp. 318–19.

[26]Personal letter, July 1, 1925.

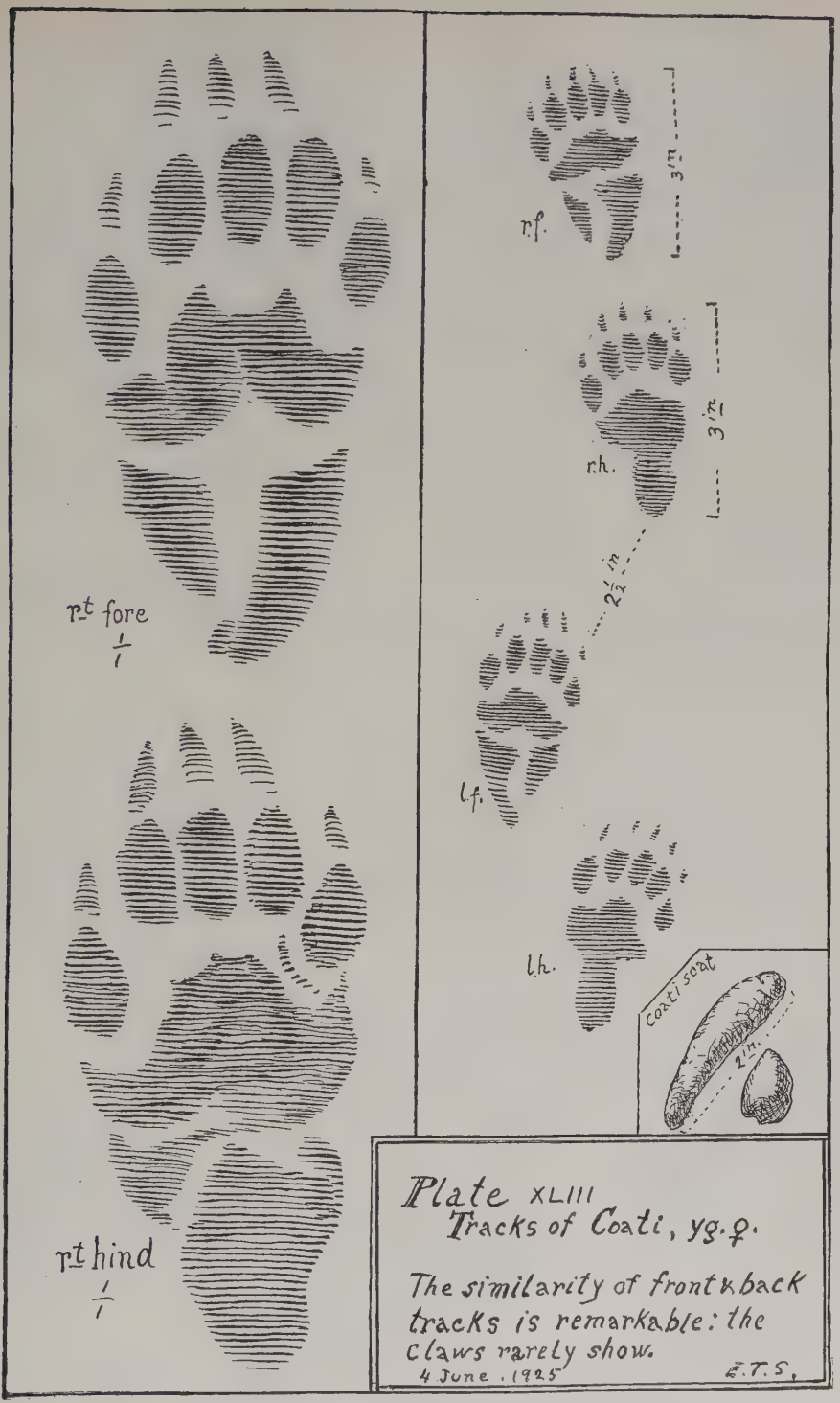

Plate XLIII
Tracks of Coati, yg. ♀.

The similarity of front & back tracks is remarkable: the claws rarely show.
4 June. 1925 E.T.S.

drop to the ground from the highest trees, as if they were dead, when the trees are struck with a stick or hatchet."[27]

In amplification, Goldman says: "The Coatis are largely arboreal in habits, but they appear to be equally at home upon the ground. They are sociable animals, and commonly range about in parties or troops consisting of several old females and younger animals of both sexes. The old males are met with alone, and from their solitary habits, are in many localities supposed to be of a different species. They are referred to in Panama as *pisote solo*, to distinguish them from the more gregarious *pisote de manada*. Under other native names, the same distinction is made in other parts of Middle America."[28]

Although akin to the Raccoon, which is as nocturnal as any creature may be, Azara says of his captive: "It reposes the whole night, though seldom during the day, bending the body on itself, and turning the muzzle backwards, and the tail forwards."[29]

My own specimen was active almost all day, and to some extent by night, though night time was its usual rest. Goldman adds: "The Coatis are less strictly nocturnal in their activity than some of the other members of the family. At Gatun, several parties of from 5 or 6 to a dozen individuals, were seen roaming through the forest during the morning and evening hours. During the heat of the day, they were occasionally startled from a resting place in the trees, from which they tried to escape by running along large branches and passing across into other trees, or came bounding down and off along the ground."[30]

Whether it has any games or places for social diversion, or cries that are the assembly of its clan, or a prolonged call or song, are questions to be yet solved by the naturalist.

Strange Instance

Concerning the following strange and morbid instance, I have no illuminating comment to offer. It is given by Azara thus: "I once saw a domesticated individual which had a tumour on its abdomen, which to all appearance occasioned it no inconvenience; when ripe, it extracted the matter through a hole which it made by scratching; six days passed without the wound closing, and without its perceptibly ailing, for it ate and moved about as if in perfect health; but on the morning of the seventh day, it

[27] Azara, p. 318.

[28] Mamm. Panama, p. 154.

[29] Azara, p. 319.

[30] Mamm. Panama, p. 154.

PLATE XL.—RACCOON STUDIES FROM LIFE
By E. T. Seton

PLATE XLI.—PHOTOS OF COATIMUNDI YOUNG FEMALE

recommenced the scratching, bursting open the abdomen; it continued to extract the intestines and entrails whilst life remained, and determinately accomplished its suicidal act, without being restrained by the pain from which it must have suffered."[31]

The Brave Wild Thing

"When hunted with Dogs," says Goldman, "a whole party will quickly climb trees, and pass across from one tree to another, until they reach a point where they can go no farther in that direction. If one or more are shot, the others usually attempt to escape by running down the tree trunks; reaching the earth with a bound, they frequently avoid the waiting Dogs, and go scampering off to another tree. If caught by the Dogs, they fight savagely, and slashing with their long, sharp tusks, often inflict serious wounds."[32] As Azara briefly put it a century ago, "It defends itself from Dogs by biting; and as its canines are furnished with two edges, it inflicts wounds which sometimes occasion death."[33]

References for Coatimundi

1801—Quadrupeds of Paraguay, by Azara (See References for Jaguar, Vol. I).
1920—Mammals of Panama, by E. A. Goldman, Smiths. Misc. Coll., Vol. 69, No. 5.

[31] Azara, pp. 319–20.

[32] Mamm. Panama, 1920, p. 155.

[33] Azara, p. 319.

LIFE XXV—THE RINGTAIL

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Ringtail, Raccoon-fox, Cacomistle, Cacomixtl, Coon-cat, Civet Cat, Cat-squirrel, Civet-Fox, Ring-tailed Cat, Bassaris, Bassarisk, Bandtailed Cat, Ringtailed Raccoon

Bassariscus astutus (Lichtenstein)

(Gr. *Bassaris*, a Fox, with diminutive suffix; L. *astutus*, clever)

Bassaris astuta Lichtenstein, 1831, Isis, Vol. 24, p. 513.
Bassariscus astutus Coues, 1887, Science, Vol. 9, p. 516, May 27.

Type Locality—Southern Mexico

Native Name in Lower California, *Babisuri* (Nelson).
Mexican Aztec Name, *Cacamiztli* and *Tepe Maxlaton* of Hernandez (Baird), *Cacomistle* (Goldman).

The genus *Bassariscus* Coues 1887, belongs to the *Procyonidae* or Coon Family. They resemble Coons in general anatomy and in dentition but differ in being smaller and more slender, also in having tail bushy, very long, as long as the body, conspicuously ringed black and white; ears, large; soles, hairy; pads, however, naked as in the Coon; claws, half retractile.

In addition to the generic characters, the Cacomistle has the following:

Size. Total length, 27 to 32 in. (682 mm. to 810 mm.); tail, 14 to 17¼ in. (356 mm. to 438 mm.); hind foot, 2⅝ in. (67 mm.); ear, from crown, 1½ in. (38 mm.).

Weight. 2½ lbs.

Colour. A ♂ from San Antonio, Texas (Feb.), general colour, pale, soft, yellowish gray, with so many black hairs scattered over the back and head that it is there tinged darker; this yellow-gray becomes warmer on the flanks. All below, clear yellowish white; feet, soft yellow-gray above and white beneath. The cheeks and lips are white with a blackish patch around the front half of the eye, and a blackish whisker-bed, combining the dark marks of Flying-squirrel and of Gray-fox; ears, brownish behind, becoming whitish at tips. Tail, on top, with 7 black bars and one basal dusky bar, alternated with pure white; but on the underside, the white is continuous down the centre. Whiskers, blackish, and 2 to 3 in. long.

This represents the race *flavus*. The typical *astutus* is very similar, but grayer above and yellower beneath. Also its fur is notably harsher and shorter.

The ♀ is similar, but a little smaller.

When seen alive, this bright active creature of the darkness looks like a cross between a Coon and a Flying-squirrel. Its big and beautiful eyes lend an expression of alertness and intelligence that is not belied by its disposition and habits. But its grand label mark is the wonderful ringed tail that proclaims its Coon affinities and has given it several of its names.

Races

The following forms have been recognized:

astutus Lichtenstein, the typical form. T. l., Southern Mexico.

flavus Rhoads, smaller than *astutus;* tail shorter than body, often entirely encircled by black rings, T. l., Texas, exact locality unknown.

oregonus Rhoads, back intense black, below deep brownish yellow (*raptor*). T. l., Grant's Pass, Josephine Co., Ore.

saxicola Merriam, like *flavus*, but smaller. T. l., Espiritu Santo Island, Gulf of California, Lower Calif., Mexico.

palmarius Nelson & Goldman, much like *saxicola*, but slightly darker, with facial marks clearer. Differs from *oregonus* in being smaller and grayer and in having shorter fur. T. l., Comondu, Lower Calif., Mexico.

insulicola Nelson & Goldman, closely related to the two preceding; but the yellowest of all the races. T. l., San Jose Island, Gulf of Calif., Lower Calif., Mexico.

sumichrasti Saussure, a very small form with longer tail and less heavy feet; this and the next two are close akin. T. l., Mirador, Vera Cruz, Mexico.

variabilis Peters, intermediate between *sumichrasti* and *notinus*. T. l., Caban, Guatemala.

notinus Thomas, a large form, with small teeth; ten black bars on tail; feet fawn-gray. T. l., Boquete, Chiriqui, Panama.

albipes Elliott, a large dark form with white feet. T. l., near Vera Cruz, State of Vera Cruz, Mexico.

nevadensis Miller, a pale gray form, smaller than *oregonus*. T. l., Eldorado Cañon, Clark Co., Nevada.

MAP V.—RANGES OF RINGTAIL AND OF LEAST WEASEL

By E. T. Seton, with assistance of the Biological Survey

Range of Ringtail, in the south.

Range of Least Weasel, in the north. All available records are spotted; also, the type localities of the four races.

Range

At present it is impossible to indicate the range in detail. On the map, its northern limit is shown with a black spot for each definite record. The various races are entered by their type locality. It is understood that the Ringtail is found in suitable places throughout the country between the northern limit shown on this map and the Isthmus of Panama. In Mexico, it is distributed from near the coast to 10,000 feet above the sea.

"The Civet cat is common all over Texas," says Bailey, "except the open plains country of the western half from Brownsville, Corpus Christi, Seguin, Austin, Brownwood, and Grady, westward. It has been reported east to Matagorda County, near the coast, and a specimen in the U. S. National Museum is labelled 'Red River.' One from Grady, Fisher County, seems to be the northernmost authentic record for the State, but the species undoubtedly continues along the cañons and cliffs of the eastern edge of the Staked Plains to the Red and Canadian rivers."[1]

The Red River specimen mentioned above, was secured at Cross Timbers by Capt. R. B. Marcy in 1852.[2]

Audubon and Bachman say: "As far as we could ascertain, the northern limit of the range of this species is somewhere in the neighbourhood of the southern branches of the Red River. As you travel south, they are more abundant, and probably are found throughout all Mexico; we were informed by our friend, the celebrated Col. [John C.] Hays, the Ranger, that he saw them more abundant in the mountainous region near the headwaters of the San Saba River than at any other place."[3] But fuller investigation has continually extended the known range.

According to H. H. Kopman:[4] "Two rather rare fur-bearing animals occurring in Louisiana, and found sometimes in the catches of the trappers, are the Spotted Skunk or 'Civet-cat' (*Spilogale indianola*) and the Ring-tailed Cat (*Bassariscus astutus flavus*), which is known also as the 'Civet-cat.' The Spotted Skunk is a coastwise species, being found chiefly to the westward, while the Ring-tailed Cat is said to stray across the border from Texas."

Peter A. Brennon, of Montgomery, Alabama, reports the taking of a Texan Bassaris at Matthews, Montgomery Co., Ala., April 16, 1922. The specimen is now in the State Museum. A Negro Coon hunter claims to

[1]Texas, pp. 182–83.

[2]Expl. Red River, La., 1854, p. 186.

[3]Q. N. A., II, p. 318.

[4]Wild Life Resources of Louisiana, State Dept. Conserv., Dec., 1921, Bull. No. 10, pp. 29–30.

have caught another in 1915. He described it as a "99-year-old Weasel with rings in his tail."[5]

Haunts and Numbers

One observer says: "Although preëminently inhabitants of rocks, cliffs, and cañon walls, Civet-cats are common over the chaparral, mesquite, and cactus plains of southern Texas down to the very coast, a peculiarity of distribution shared by a number of other mammals which find in the thorny cover of dense patches of cactus and tangled thickets of chaparral, ample protection and a greater abundance of small game than in the rocky haunts of the higher country."[6]

Merriam and Bailey both tell me that in their experience, this animal is a rock-dweller and not arboreal. So, also, Nelson says that in the Southwest and in Mexico, they sometimes frequent the old cliff dwellings and Aztec ruins.[7]

Audubon found them in Texas, living the life of a Squirrel, with a hollow tree for home and refuge.[8]

Equally squirrel-like is the habit shown in this final contribution by Nelson: "One morning in February, 1893, soon after sunrise, I chanced to pass through a little wooded square in the City of Mexico, and saw a lot of boys pursue and capture one of these animals which, having overstayed his time, had been surprised by daybreak. This wanderer might have had its den in some house in the neighbourhood, since one of its known habits is to take up its abode about houses, even in the midst of towns. A friend living in the City of Mexico informed me that after having been annoyed for some time by noises on the roof at night, he investigated and discovered a female Cacomixtle with partly grown young snugly located in a nest placed in a narrow space between the tile roof and the ceiling."[9]

In a sentence, the Ringtail loves a hole in a high place. He asks for a tight fit, so as to exclude bigger animals, and he must be near cover where there are water and good forage. Last, it must all be in a warm climate, for he is a child of the sunny South.

During the season of 1920, in the California National Forest, 1600 square miles in area, 119 of this species were caught.[10]

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[5] Journ. Mamm., Feb., 1923, p. 54.

[6] Bailey, Texas, p. 183.

[7] W. A. N. A., p. 586.

[8] Q. N. A., II, p. 316.

[9] W. A. N. A., p. 587.

[10] Cal. F. & G., April, 1920, p. 89.

PLATE XLII.—PHOTOS OF COATI, NO. 2

PLATE XLIV.—RINGTAIL OR CACOMISTLE
Drawing loaned by New York Zoölogical Society

Nocturnal Habits, and Tracks

While investigation has increased its known range, this does not necessarily mean that the Ringtail is spreading. First, it is strictly nocturnal, and so shy and elusive in its habits that many a farmer, right in the region of its chief abundance, has never once seen it alive.

Snug in his high aërial castle dwells the Ringtail, and sleeps placidly through the hours of brightness. Not even at sundown will he venture forth, as do so many of the gray-light creatures. Night, the very blackest, must be on woods and hill, before he unwinds his famous tail from his elegant body, peers with big, bright eyes from his high doorway, and commits himself to the adventures of his daily night.

Long before dawning, he is fed, back, and upcurled again in his home hole; and the only proof that one commonly finds of his life and presence, is the endless chains of catlike tracks in the dust—chains that often wind in and around the dobie houses of the Mexican towns, in spite of Dogs and enemies galore. For the Ringtail is crafty, silent, and alert, and would not venture into such places, if he had not often made a success of it before.

As a rule, one can guess fairly at an animal's affinities, on seeing its tracks. But those of the Ringtail would prove utterly misleading. Instead of the long-fingered, flat-footed tracks of his big brother, the Coon, his are rounded, dainty, and toe-tipped, like those of a Cat; but like the Coon, it shows five toes (not four) in each track.

Den, Mating, and Young

As already noted, the homing-hole of the Ringtail is any place that would appeal to a very big Squirrel. But by whom it is prepared and lined, and in what fashion, is not yet a matter of complete record.

According to Audubon, "They are much attached to the tree on which they live, which is generally a post-oak, a live-oak, or other large tree; and they seldom quit the immediate vicinity of their hole, unless when driven out by thrusting a stick at them, when they ascend the trunk of the tree and jump about among the higher branches, so long as the pole is held close to their nest; as soon as this is withdrawn, they descend, and at once reënter their dwelling place, and hide themselves. These animals have a singular habit of eating or gnawing off the bark around the mouth of their holes, and where the bark does not appear freshly peeled off at their hole, you may be certain the animal is not at home, or has deserted the place. Their holes

are generally the result of natural decay, and are situated on knobs, or at the ends of branches broken short off close to the main trunk.

"They generally select a hole of this kind on the lower side of a leaning tree, probably for better protection from the rain; their holes vary in depth but are seldom more than about a foot or eighteen inches to the bottom; they are usually furnished with moss or grass for bedding."[11]

Finally, although it really came first, the Ringtail castle must have its security, as well as its comfort, assured. So barb-wire entanglements there are in abundance about the selected tree. As Audubon said of those he saw in Texas: "At the foot of many of the trees whereon they dwell, the cactus, brush-wood, and chaparral generally are so thick and tangled that a man would be pretty well scratched should he attempt to penetrate the thorny, prickly thicket which surrounds the dwelling-place of this solitary and singular animal."[12]

If this bright-eyed child of the darkness lives up to the Coon tradition, it pairs; and both parents take an active part in raising the young. But no observations are at hand to prove it. Audubon mentions that during his stay in Texas, he was able to procure only about half-a-dozen of these animals; among which, to his regret, there was not a single female,[13] which if it proves anything, shows that at certain seasons the habits of the male differ from those of the female.

We know less about the young of this common animal than about those of any other creature of the size in North America; the following four sentences, all the written knowledge available, are a measure of our ignorance. Audubon and Bachman say this animal "produces 3 or 4 young at a birth, as has been ascertained from the animal kept in confinement."[14]

Bailey's contribution is that "an old female caught near Boquillas, May 27, contained 3 nearly developed fœtuses, which, with a litter of 4 young recorded by Mr. Clark from San Pedro River, would indicate small families."[15]

Similarly, Frank Stephens says: "My female, caught May 16th, contained 3 small fœtuses. They are said to rear 4 kittens more often"[16]; to which Nelson adds that they are born in May or June.[17]

[11] Q. N. A., II, pp. 316–17.
[12] Q. N. A., II, p. 317.
[13] Q. N. A., II, p. 316.
[14] Q. N. A., II, p. 318.
[15] Texas, pp. 183–84.
[16] California Mammals, 1906, p. 225.
[17] W. A. N. A., p. 586.

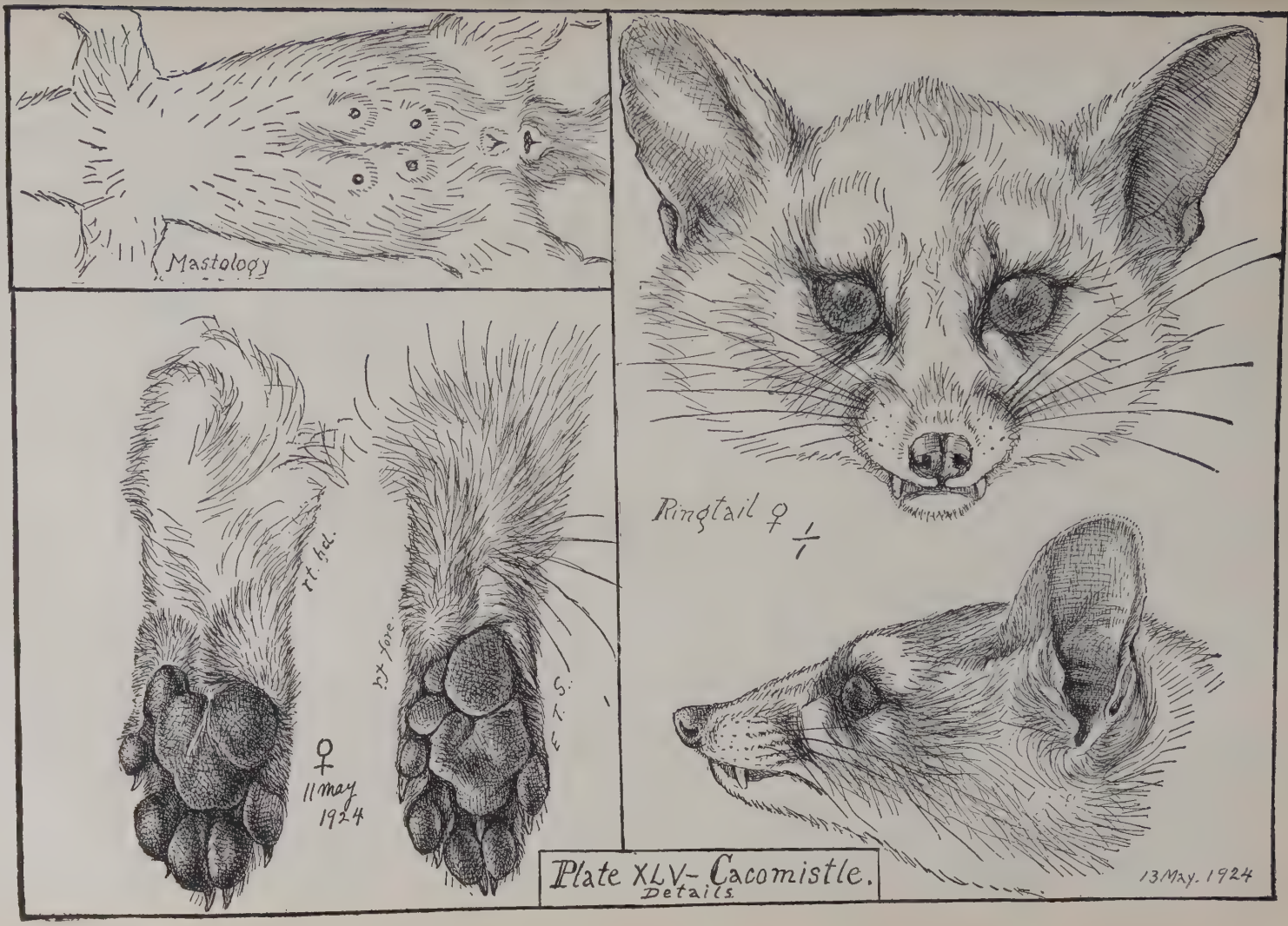

Plate XLV- Cacomistle.
Details

Voice

Only two of the observers cited have made notes on the voice of the Ringtail. If we expect to find it a Coon in miniature, so far as sounds are concerned, we are going to be disappointed. It is credited with an occasional "vicious scream of mixed fear and rage," which is true of every flesh-eating animal in these Lives; and also with a complaining cry when complaint seems necessary. Finally, when caught in a trap, it may bark almost like a small Dog or Fox, which bark is occasionally heard at night in its home woods.

For some months I kept two females in captivity. They never became at all tame; and at nearly every approach, one or other would utter the short, explosive bark or snarl that all observers have recorded.

None of this is very complete or satisfactory, and merely emphasizes the chance for some young naturalist to rewrite the chapter.

Food

The first evidence one gets of its food habits, inclines one to list it as a flesh-eater, as carnivorous as a Cat. Bailey found them troublesome robbers of his mouse-traps, when collecting in Texas. He says: "At night, they prowl along the ledges of cliffs from cave to cave, leaving the prints of their little round cat-like feet in the dry dust of the darkest corners, and helping themselves to a liberal share of the *Peromyscus* and *Neotoma* found in the traps of careless collectors."[18]

Fuller investigation greatly extends its bill of fare. Thus, Audubon and Bachman say: "The food of the species is chiefly small animals, birds, and insects; they also eat nuts, as we were told, descending from their hiding place, and travelling to the pecan and other trees, for the purpose of feeding on the nuts; which, if true, is singular, as they are decidedly carnivorous in their dentition."[19] To which they add: "Sometimes pecan shells are found in these holes, which no doubt affords presumptive evidence that the Bassaris feeds upon this nut."[20]

Bailey's search after the only unquestionable evidence resulted in the following: "Most of the stomachs of *Bassariscus* examined have been found to contain the bones and hair of small rodents, which make up also most of the excrement found along ledges and in caves where the animals live.

[18] Texas, p. 183.

[19] Q. N. A., II, p. 316.

[20] As above, p. 317.

Fragments of a large centipede were found in the stomach of one caught by Gordon Donald on Devil's River; and in other localities they have been reported as eating fruit. At Langtry, Gaut caught several in traps baited with meat."[21]

Nelson sums up its food habits thus: "Like its relative, the Raccoon, the Cacomistle, with a taste for a varied fare, takes whatever edibles come its way. It stalks Wood-rats, Mice, and even Bats amid their rocky haunts, and birds in bushes and low trees. About the southern end of the Mexican tableland it is much disliked for its robberies of chicken roosts, especially when these are located in trees. Insects of many kinds, larvæ, and centipedes are eaten, as well as a great variety of fruits, including that of the pear-leaved cactus, and dates, figs, and green corn."[22] In amplification of the last, he says: "Ring-tailed Cats regularly locate among rocky ledges, neighbouring orchards, or other cultivated areas where they may gather some of the bounty provided by man. I found them more plentiful among the broken lava cliffs bordering date-palm orchards in Lower California than in any other place. When the dates were ripening, they prowled about under the palms after dark, with Gray-foxes and Spotted Skunks, to pick up the fallen fruit."[23]

The captives in my menagerie would eat any sort of meat or sweets. Dates and figs were especially acceptable. Sugar, in any form, they would devour with avidity.

His Way of Life

What should it be, for a creature that is a cross between a Coon and a Fox, with the fur of a Flying-squirrel? Dull and lethargic he may be during the heavy hours of sun heat, that all wise creatures give to sleep; but when the twilight has given place to the gloaming, and the gloaming to black dark, this bright-eyed, playful, nimble child of the high-holes peers forth from his safe retreat, swings slowly at first like a Coon; then, limbering up, he begins to leap and scramble like a Squirrel. His great ringed tail is swinging squirrel-fashion as he courses up long sloping limbs, or makes a flying leap across a 5- or 6-foot space; and one wonders if it does not answer as a parachute in case of a fall.

At the slightest promising sound of bird on roost or in nest, or of catchable young Rabbits in the undergrowth, he freezes. Still as dead he holds, but every line and fibre of his make-up is tense with life and pent-up energy.

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[21] Texas, p. 184.

[22] W. A. N. A., p. 587.

[23] As above, p. 587.

The beautiful animalism of his whole body finds fit expression in his face. All who have marked those big liquid eyes, the mobile snout, the alert expression of the visage, are enthusiastic over its beauty and look of bright intelligence. Even the ears, so little moved in some creatures, are full of expression in the Ringtail; while the long, black, abundant whiskers do their part as vibrant feelers, and as features that show something of the little mind within.

His nightly prowl must be sometimes through the tree-tops, too, for he gathers the "high 'simmons" where they hang. But he is also much on the ground, for there are found many of his favourite foods; and there, next morning, we find his endless chains of trail.

Though so nocturnal, the Ringtail has a sunlight habit that all the wood-wise indulge in from time to time, as a tonic—that is the periodic sunbath.

"Sometimes," says Audubon, "the Ring-tailed Bassaris may be seen squatted on the top of a branch, basking in the sun, and half rolled up, appearing almost asleep. On the slightest manifestation of danger, however, he darts into his hole (which is always within a foot or two of his basking place), and he is seen no more."[24]

A final paragraph by Audubon gives an entirely new chapter of the Ringtail's life, emphasizing, as it does, the Squirrel side of its nature, and showing that it must be much less strictly nocturnal than the previous observations might lead one to suppose.

"When scolding or barking at an intruder, the Ring-tailed Raccoon (as this animal is called by the Texans), holds the tail over its back, bending it Squirrel-fashion; this animal, however, does not stand upon his hind feet like the Squirrel, and cannot jump or leap so far. We have not heard of their springing from one branch to another beyond the distance of about 10 feet, and when frightened at the presence of a man, they will sometimes run along a branch even toward him, in order to get within jumping distance of another; evincing more timidity than a Squirrel exhibits in springing among the boughs, although they run up the bark with ease, holding on with their claws."[25]

His Temperament

These same naturalists write: "We have the impression that only one of these singular animals is to be found on a tree at a time; they therefore

[24] Q. N. A., II, p. 317.

[25] As above, p. 317.

are not very sociable in their habits; and as the live-oak and other trees are generally very much scattered, and many of them have no holes suitable for residence for the Bassaris, it is very difficult to procure one."[26]

The wildest, shyest thing in the w ld shy wor d of the woods is the Cougar. Yet of all our creatures, it is the easiest to tame if taken young. This union of extremes is often seen, and the Ringtail is a good example in point.

Audubon says: "Notwithstanding the shyness and retired habits of this species, it is easily tamed, and when it has been confined in a cage a sufficient length of time, is frequently let loose in the houses of the Mexicans, where it answers the purpose of a playful pet and catches Mice and Rats. We have seen one that was thus domesticated, running about the streets of a little Mex can village, and we were informed that one was kept as a great pet in a Comanche camp, visited by the Indian who hunted for us during our exploration of the western part of Texas."[27]

To this Nelson adds: "During the early years of gold-mining in California, when many men were living in rude cabins in the mountains, the prevalence of Mice often attracted these 'Cats' to take up their residence there. Often the owner of the premises and the mouser struck up a friendly relationship; and the Cacomixtle, becoming as free and friendly about the place as a real Cat, kept it entirely clear from Mice. I have had first-hand accounts of these tame individuals from miners who had harboured them in this way for months. These accounts always gave the impression that the animal was somewhat playful and mischievous, and most attractive to have about the premises."[28]

References for Ringtail

1849—Quadrupeds of North America, by Audubon & Bachman, Vol. II.
1905—Biological Survey of Texas, by Vernon Bailey, N. A. F., 25.
1918—Wild Animals of North America, by E. W. Nelson.

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[26] Q. N. A., II, p. 317.
[27] Q. N. A., II, pp. 317–18.
[28] W. A. N. A., p. 587.

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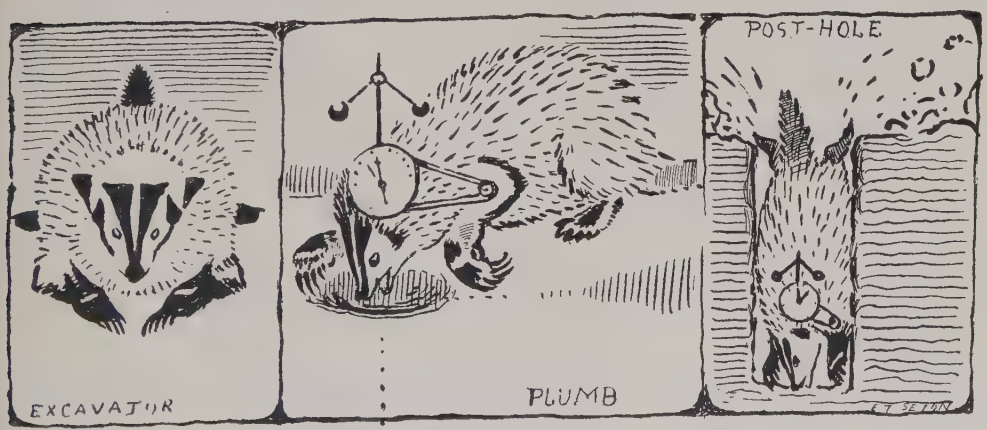

Common Badger of America, Blaireau, Brairo, or Braro

Taxidea taxus (Schreber)

(L. *Taxidea*, from *taxus*, a Badger, and Gr. *eidos*, like; Latinized into a name applied because of the creature's resemblance to the Old World Badger or Taxus)

Ursus taxus Schreber, 1778, Säugthiere, III, p. 520.
Taxidea taxus Rhoads, 1894, Am. Nat., XXVIII, June, p. 524.

Type Locality—Usually given as "Labrador" and Hudson Bay; but almost surely Saskatchewan River, in the vicinity of Cumberland House.

French Canadian, *le Blaireau d'Amérique; le Brairo.*
Cree, Ojibway and Sauteaux, *Mit-ten-usk.*
Yangton Sioux, *Ho-cang.*
Ogallala Sioux, *Ho-ká* (shaggy or bristly).
Mexican, *Tajonis.*

On July 31, 1804, at a point near Omaha on the Missouri, Lewis and Clark enter this: "One of our men brought us yesterday an animal called by the Pawnees *Chocartoosh*, and by the French *Blaireau* or *Badger*."[1] This is the earliest record I find of this animal in American travels. In other parts of the same narrative, the animal is called *Brairo* and *Braro*.

The genus *Taxidea* (Storr, 1780) comprises large animals of the Weasel Family (*Mustelidae*). They have thick, heavy bodies, very short tails, short legs, front feet immensely powerful, with long claws and developed for digging; ears, very short, and the following teeth:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{3-3}{3-3}\text{; mol. } \frac{1-1}{2-2} = 34$$

To these generic characters, the Badger adds:

Size. Length, about 28 in. (711 mm.); tail, 5 in. (127 mm.); hind foot, $3\frac{7}{8}$ in. (97 mm.).

A large ♂ collected by H. H. T. Jackson measured as follows: Total length, 764.5 mm.; tail vertebrae, 131.8 mm.; hind foot, 103.4 mm.[2]

[1]Journal, I, p. 39.

[2]Wis. Mamm., p. 28.

Dr. R. W. Schufeldt calls attention to the wide divergence of Badger skulls as evidenced by Nos. 22253 and 2572, Coll. U. S. Nat. Mus. These skulls, according to certain modernist rules, should furnish the basis for different genera.[3] (See Plate.)

Weight. The following Badgers I weighed at Clayton, N. M., in 1893:

♀, taken Oct. 26th, was 10½ lbs.

♀, taken Nov. 2d, was 14 lbs. 5 oz.

♀, taken Dec. 28th, was 16¼ lbs. (excessively fat).

♂, taken Dec. 29th, was 14¼ lbs.

Bachman gives 23 pounds as the weight of one he examined in the menagerie at Charleston, S. C.[4]

H. H. T. Jackson writes: "June 13, 1902, I obtained an adult male 4 miles east of Milton [Wis.]; this specimen weighed 23 lbs. 6 oz."[5]

Colour. General colour above, silvery gray, each hair being yellowish white at base, then blackish, with a white tip; neck, crown, and muzzle above, brown; cheeks, chin, and stripe from nose over head to shoulders, white; under parts generally yellowish white; bar on each cheek, back part of ear, and the feet, dull black; tail, tinged yellowish brown.

When seen alive, it looks like a small Bear that has been flattened somehow, coloured silvery gray, and adorned with black and white marks on the head.

Races

The following forms are recognized:

taxus Schreber, the typical form. T. l., probably Cumberland House, on Saskatchewan.

neglecta Mearns, smaller, with longer tail, and with colours deeper and richer than in either the preceding or following. T. l., Fort Crook, Shasta Co., Calif.

berlandieri Baird, distinguished by having the white line continued along the back, in some cases to the tail, also by a general buffiness of colour (as compared with the silvery gray of *taxus*); and heavier markings. T. l., Llano Estacado, Tex., near border of New Mexico.

infusca Thomas, similar to *berlandieri*, but darker. T. l., Santa Anita, Lower Calif., Mexico.

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[3]Journ. Mamm., Aug., 1922, pp. 173–75.

[4]Q. N. A., I, p. 363.

[5]Wis. Mamm., p. 28.

phippsi Figgins, much like *berlandieri*, but distinguished by a general extension and intensification of dark areas. T. l., northeast of Chromo, Archuleta Co., Colo.

Range and Records

The map shows the range of the Badger in the Northwest to coincide with the untimbered regions in which the larger kinds of burrowing rodents are found in numbers. In the dry popular country that is varied with open glades, it is occasionally found far from the prairies. MacFarlane records a specimen from Isle à la Crosse, in 1889, and 2 from Green Lake, 1889 and 1890.[6]

While travelling on the Athabaska, in 1907, I was shown by the pilot, John MacDonald, a range of hills where 2 Badgers were killed by François Black, one in 1905 and the other in 1906. The exact neighbourhood was Red Willow Lake, 18 miles southeast of Fort MacMurray; the place is spotted on the map. He said that the animal was previously unknown there, but some Plains Indians, who happened to be at the Post, knew these animals at once, and called them "Mittenusk."

Roderick MacFarlane says: "If it ever extended as far as the Peace River, it must have been many years ago, as not a single example has been traded by the Company in that quarter since 1858 (I have no earlier data)."[7]

Manitoba. In the Northwest, the Badger is confined to the dry prairie regions. It is very rare in the half-timbered country, and unknown in the thick woods. It seems, indeed, to be the exact complement of the Woodchuck, which, on account of these facts, is known to the Hudson's Bay Company people as the "Thick-wood Badger."

Michigan. Norman A. Wood reports:

"The species is not of rare occurrence throughout the entire State."[8]

The spot in northern Michigan is on the authority of Dr. Charles C. Adams.[9]

Washington. L. R. Dice, in his "Mammals of Southeastern Washington," says: "Numbers occur throughout the bunchgrass region of Walla Walla and Columbia counties. In the Blue Mountains, a few occur on the ridges in open places, and among the low bushes."[10]

Ohio. In Ohio, according to H. E. Hall, "We have quite a few in this

[6] Mamm., N. W. T., p. 715.

[7] Mamm. N. W. T., p. 715.

[8] 14th Rep. Mich. Acad. Sci., 1912, p. 163.

[9] Ecological Survey, N. Mich., 1906, p. 130.

[10] Journ. Mamm., Nov., 1919, p. 12.

State. They appear to have developed a distinctively Ohio behaviour, because they are all found in or about graveyards. At Wauseon and Elmira, they have become a pest, tunnelling under the graves, bringing bits of clothing to the surface, etc."[11]

Wisconsin. "The Badger is found regularly in the sandy regions of the northern part of the State, but southward it becomes more uncommon."[12]

Haunts and Home Range

Dry, rolling prairies of light or gravelly soil, with a high populative rate of Ground-squirrels, are the Badger's ideal surroundings.

John Atkinson, the Lake Winnipeg guide, writes me that he found a few of these animals in the drier country between Winnipeg and Whitemouth River, also about the gravelly hills east of Gonor, Manitoba, which are wooded country.

On the heavy clay prairies of the Lower Red River, however, it is scarce; and, of course, on swampy lands it is unknown.

There is little direct evidence at hand to show the home range of an individual Badger, but, obviously, it must be very small. As a matter of opinion, I should say that a Badger may pass his whole life within a mile or two miles of his original home. In Texas, Vernon Bailey found that one Badger had worked all summer in a 20-acre field; and of the species in general, he says that, when food is scarce, they become great travellers, "sinking a house in the earth wherever sleeping time overtakes them."[13]

Numbers, Fur, and Service

In early days, there was at least one Badger for every square mile of high, dry prairie in Manitoba, and perhaps one third as many on the heavy clay prairies of the Red River Valley; which would give a Badger population for the Province of some 20,000. To-day their numbers are much reduced by trapping, poison, and the destruction of Ground-squirrels, their food supply; as well as by the disturbance of the plough. For the Badger is a shy prairie animal, and is likely to disappear when all the open country is under cultivation. Professor John Macoun tells me that, in 1906, Badgers were yet so abundant on the prairie around White Shore Lake, 40 miles south of Battleford, Sask., that there seemed to be about 10 inhabited dens per square mile.

[11] Personal letter, Jan. 8, 1908.

[12] Wis. Mamm., p. 28.

[13] N. A. F., No. 25, pp. 184–85.

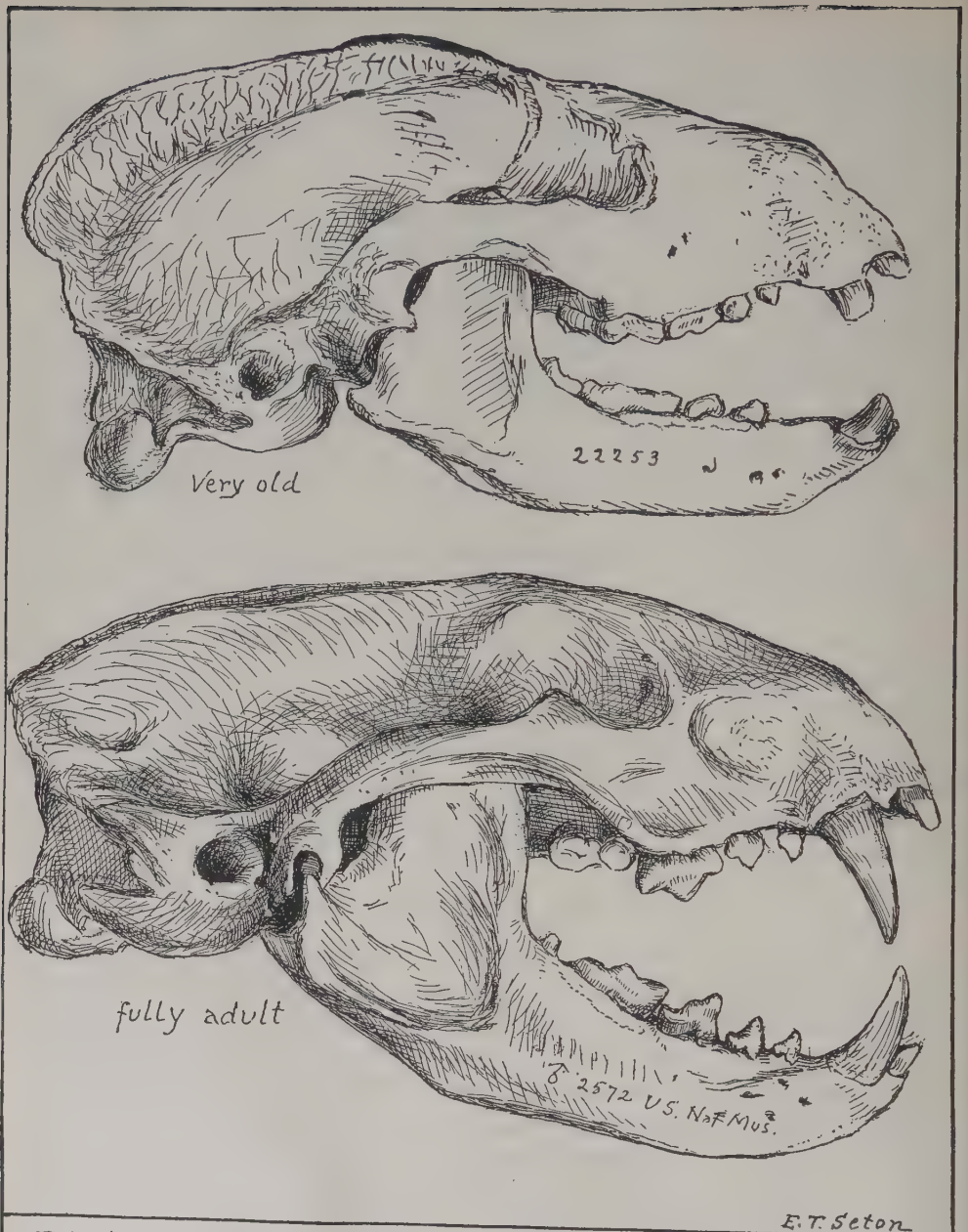

Plate XLIX. American Badger skulls 1/1
to show extreme variation
Redrawn from Dr R. W. Shufeldt's photographs.
Journ. Mamm. Aug. 1922, p. 174.

Its pelt is of a beautiful silvery gray, and the hide so durable and strong that at one time its principal use was for rugs. But its beauty has now given it a place among the longer furs used for borders and trimmings.

During the 64 years, 1842 to 1905 inclusive, the Hudson's Bay Company collected 81,837 skins of this species, an average of 1,278 for each year. The lowest was 289 in 1904 (none at all prior to 1842); the highest, 4,000 in 1891. The average for the 10 years, 1895 to 1905, was 2, 445.

Poland's work[14] appears to show that double as many are taken by the other American companies, so that the annual catch of Badgers for fur may be about 7,000.

At the London annual fur sale held at Lampson's, March, 1906, 5,955 Badger skins were sold. The highest price reached was 19 shillings ($4.56) each, for 27 unusually fine first-class skins. More usual prices were 5 shillings ($1.20) to 10 shillings ($2.40) for first-class skins. Inferior skins sold for a shilling (24 cents) or even less.

According to the Official Fur Returns of the Canadian Government, the numbers of Badgers taken in Canada were as follows: for the seasons 1919 to 1923, respectively, 5,570; 1,216; 1,777; 2,900; 5,185.

Like most pelts, it is prime about October 1st and continues so till April 1st.

The returns show that about 6,000 Badger skins are marketed per annum. This means a destruction of at least 12,000; for many, maybe most, are killed in summer when the pelt is not fit to market. The species has stood this drain without serious diminution. Therefore its numbers must be at least 60,000 to-day.

The Badger must be considered a valuable animal, as surely as we reckon the Gophers, or Ground-squirrels a nuisance. The only sin I ever heard charged against it, is that the holes it makes endanger the limbs of stock and the lives of horsemen on the Plains. In the prairie States to-day, however, the work of the Badger is confined chiefly to the strips of land that exist along the road allowances, where it can do but little harm.

On the positive side, according to the Biological Survey, "Badgers are valuable in destroying Ground-squirrels, Gophers, and other burrowing animals, as well as various kinds of insects. They are extensive diggers and seem to have little trouble in securing their victims. For their valuable services full protection should be given them, even in irrigation sections, where they sometimes dig into dikes in pursuit of the rodents which, in the rôle of dike borers, cause so much trouble."[15]

[14] Fur-bearing Animals, 1892, p. 131.

[15] A. K. Fisher, Yearbook Dept. Agri., 1908, p. 192.

Food, Dung, and Track

The species is carnivorous, strictly so, as much so as any animal is ever strictly anything. The bulk of its food is, no doubt, Mice and Ground-squirrels. I have often seen places where a Badger had ripped open the long surface tunnel of the Striped Ground-squirrel, or had sunk 20 or 30 prospect holes at intervals to strike the deeper burrow, and I have no doubt that its labours were rewarded with a meal.

In the November of 1884, I followed a Badger's tracks in the fresh snow to learn that, the night before, he had sunk a number of burrows to the depth of 5 or 6 feet. In each case, he had reached the winter den of a Richardson Ground-squirrel, and doubtless had devoured the sleeper; for the Squirrel's nest lining and its grain stores were scattered about.

"Evidence of Badgers having dug out Belding Squirrels was most abundant, and such must constitute the main item of fare. Sign is most frequently encountered in the Transition Zone, but one day I met one of the animals at 8,600 feet, well into Canadian. I judge that he was as hopefully investigating a nearby Beaver colony as was I, for, as I drew near, the sounds of my approach drowned in the rush of a mountain stream, I saw, in time to halt, the agitation of the brush a few steps ahead of me, which announced his appearance not 4 feet away. For the space of seconds, he was petrified with horrified astonishment, but was then galvanized into headlong panic down the brushy hillside."[16]

"*Dakota, Fort Sisseton, June, 1887.* Their holes are everywhere. I believe Badgers have caused the scarcity of small mammals here, as the places where they have dug out Mice and Gopher holes are numerous. I counted 45 places where one had dug into a Pocket-gopher's hole, and in another locality, 58 places. They dig a small hole down until they strike the Gopher's tunnel, and continue the same process at frequent intervals until the tunnel is all cut up."[17]

The following observation was made by Edmund J. Sawyer in Yellowstone Park, at five in the afternoon of June 14, 1924:

"A Badger crossed the road some 200 feet ahead of me. The country was open, patches of sagebrush and tall grass alone growing along this hilltop. Having supposed the Badger had seen me, I was much surprised to note, after I had gone another 100 feet along the road, that he was intent on hunting Ground-squirrels. I stopped then, standing in quite open view on

[16]Howell, Mamm. Calif., Journ. Mamm., Feb., 1924, pp. 28–29.

[17]V. Bailey, Trip Through Parts of Minn. and Dak., 1887, Rep. Orn. & Mamm., Dept. Agri., for 1887, pub. 1888, p. 433.

PLATE XLVI.—RINGTAIL FEMALE

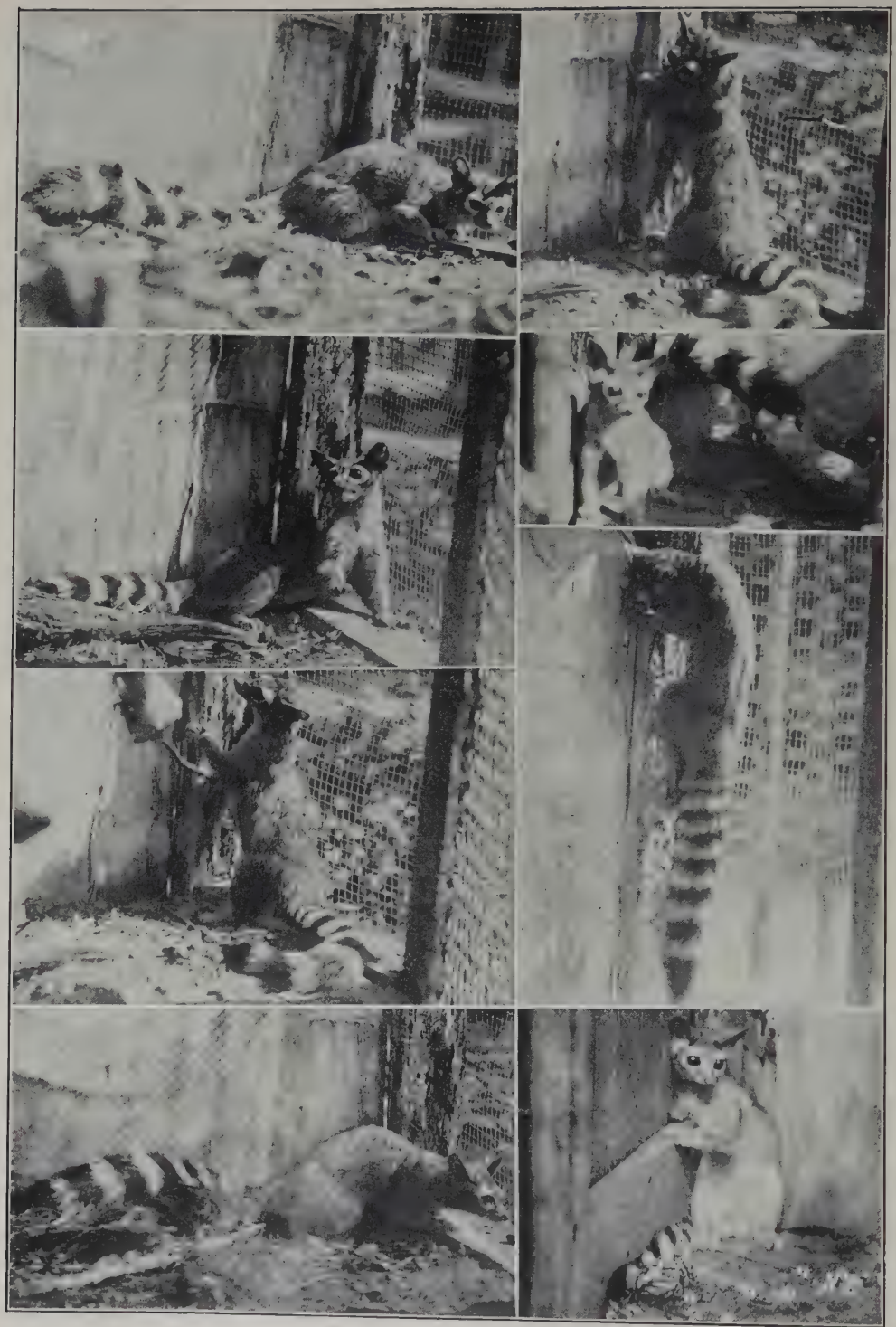

PLATE XLVII.—RINGTAIL, NO. 2

Plate L. Badger poses: by E. T. S.

the road to watch proceedings. The Badger was now among the grass tufts and the sage, Ground-squirrels were sounding their characteristic alarm trills on all sides, and then I saw the Badger run after a Squirrel, then another and perhaps a third or fourth; but each Squirrel, in turn, 'holed up' after a chase of a few yards at most. Then followed a longer chase, leading in my direction. The Badger 'ran high,' holding his head well up; the ears, small as they are, noticeably thrust forward. The speed of Badger and Squirrel seemed about equal. There was more or less dodging about among the grass and sage. Finally the Squirrel disappeared, two feet ahead of the Badger, behind a tuft of grass. Here the Badger stopped as though he had actually pounced upon the Squirrel, did a little very rapid digging with head down; raised his head, then lowered it and gave something a few shakes; turned with the Squirrel hanging limply by the neck region; trotted away thus across the road and through the sage beyond."[18]

Alexander Henry gives the following curious note in his Journal on Red River, 1799, p. 158: "This afternoon, I saw an extraordinary race—a Badger in pursuit of a Skunk. I wished to see what would be the consequence, but one of my men killed both with a club before I thought of preventing him."

The dung of the Badger emphasizes its affinity with the Skunks. This creature has the reputation of being very cleanly; whether it buries its dung, or dumps it on the run or on an anthill, is not known. At least, it keeps its den clear of it, in the zoo.

The track is sufficiently shown in the plate.

Mating

Little is known of the mating habits in this species. I am inclined to believe that, like all the higher mammals, it is monogamous; and that, as in the highest, the male, sometimes at least, stays with the female all summer and helps to protect and feed the young.

All the evidence I have been able to gather is given here. Professor John Macoun tells me that in Saskatchewan, where Badgers still abounded in 1906, he commonly saw 2 adults at each den door during the first week of August, but never 3. In each case, the bigger one, presumably the male, remained sitting, head out of the hole, with its bristles up, and uttering a sound of menace. He saw no young.

[18] Journ. Mamm., May, 1925, p. 125.

The following incident also goes to show that the species pairs, and the male continues with the female all summer. It was related to me by Russell Brown, of Sunnyside, Wash. While haying, late in June, 1902, his Dog was attacked by 2 full-grown Badgers. He went to the rescue with a fork. On killing the assailants, they were found to be male and female, but he saw nothing of any young.

R. W. Cowan, ranchman, tells me that near Calgary, Alta., during the month of September, he more than once has seen 2 adult Badgers trotting along the trail together. At such times, they are more ready to fight than to turn aside.

All of these observations point to an all-season association of the pair.

Collateral support is found in the ways of the British Badger, which is known to be a model husband and father. Although it is dangerous to rely on such oblique light (for the British Badger is not now even in the same genus with this), I cannot refrain from giving Sir Alfred E. Pease's remarks on the nesting of that amiable species.[19]

"He is fond of company; he is monogamous, and clings closely and faithfully to his own wife. With Badgers, as with the human race, the sexes are not precisely equal in numbers, and often, from the force of circumstances, a Badger has to remain a celibate, but he is not a bachelor by choice. He may become a widower, but in either case he will travel far to seek a partner to share his shelter and his lot. It is not altogether rare to find an old solitary dog Badger, who has loved and lost, or taken in late age to a hermit's cell; but he, as often as not, when he failed to secure the companionship of the gentler sex, has found some other male to share his home, when they live comfortably *en garçon*.

"Nor do the married pair shun the society of their kind. I have often seen large Badger 'sets' almost as full of Badgers as a warren is of Rabbits. One evening, near my house, I waited an hour of midge-plagued time to watch the Badgers come out from a small 'set,' and was rewarded by seeing a procession of 7 full-grown Badgers emerge from a single hole, and I had them all in full view for something like 20 minutes. As this was in July, they could hardly be one family."

It is an open question whether the hibernating Badger mates in spring like the hibernating Ground-squirrels, or in the fall like the hibernating Bear. Paul Fountain states positively that "they pair in autumn, before they hibernate."[20] This we know to be the case with the British Badger, so that the evidence is strong, though not conclusive.

[19] The Badger, a Monograph, London, 1898.

[20] Great Northwest, 1904, p. 40.

Den, Gestation, and Young

The residential burrows of the males and unmated young have not been investigated. It is probable that each Badger makes a burrow every 24 hours during the summer, while in search of food. As there is no certain way of distinguishing these prospect shafts from actual residences, the labour of digging out all, in order to run the facts to earth, has hitherto proven too serious for the investigators. It is not by any means certain that the "foot-loose" Badger does stick to any one den in his home range.

But the female has a different way of life. Her period of gestation is unknown; cannot be guessed at until we know the exact time of mating. Early in the spring, accompanied, we believe, by her mate, she prepares a complete nest of grass in a well-drained hole, 2 or 3 feet below the surface, to be the nursery of the brood.

Kennicott says: "Its habitation is not always so extensive as would be expected, and though the excavation is sometimes 6 feet deep and 30 feet long, at others it will be found only 2 feet below the surface and but 6 feet in length.

. . . . . .

"In Kansas, a female with 2 young was found in a large nest, composed of grass, and placed 2 or 3 feet below the surface, at the end of a burrow about 8 feet in extent."[21]

The young are born in late May or perhaps early June. They number 2 to 5; 3 is probably the usual number.

The following glimpse of their family life is furnished by J. R. Stringham of Holden, Utah, through Claude T. Barnes: "I saw in June, 1902, a Badger walking with her young, 12 miles northwest of Holden. I tried to capture her, but she put up such a fight that I could not, and the young ones got into a hole about 25 yards away."[22] . . . Apparently they remain in the home den until big enough to dig for themselves, which may mean till a year old. Senator J. N. Kirchhoffer, of Brandon, Man., tells me that on the Souris he once saw an old one and 2 young ones together at the den about the end of September.

L. R. Dice supplies a possible case. He says: "On June 10, 1914, about 7 A. M., a group of 4 Badgers were seen hunting in sagebrush 3 miles east of Wallula. They all seemed to be about the same size, and this was probably a family party returning from a hunt. They kept close together

[21] Quad. Ill., p. 251.

[22] Mamm. Utah, 1922, p. 136.

and moved at a slow trot, exploring the ground carefully, with nervous movements.

"Finally they all went into a group of Badger holes near a small ravine, two individuals going into the same hole. Several remained for some time at the mouths of the burrows to watch me, as they seemed to be very curious, but soon all retired and were not again seen. They seemed to be able to travel backward equally well as forward, and when only several feet from a burrow, they nearly always backed toward and down into it. Every one seemed to go into the burrow backward."[23]

As evidence on the age the species attains, two American Badgers are reported from the London Zoo; one of which lived there for 9 years 7 months the other for 12 years 1 month.

Speed, Strength, Etc.

This creature has bartered its speed for strength to dig. A man can easily overtake it if, by rare chance, it is surprised from its home. But that does not mean that it is caught, for in loose soil it can dig so fast as to escape into the ground before the foe can come near. It is supposed to be at home nowhere but underground, and I never expected to see one go aloft. So I was much surprised one day to see a caged specimen climb readily to the roof of its cage by hooking its claws in the wire netting; and another in the Winnipeg Zoo that easily and often climbed a low branching tree in its enclosure.

A Swimmer

The Badger is not usually reckoned among swimmers. Where does he get the chance to learn? is the question that arises. However, in Montana, about 1877, W. H. Blackburne, of the Washington Zoo, saw a Badger swimming the Missouri River. It was one-third way over, and calmly swimming downstream as though on a long voyage, when it was shot by an Indian.

Again, according to Norman A. Wood, of Ann Arbor, "In the mid-afternoon of August 4, 1920, a Badger (*Taxidea taxus taxus*) was found swimming in the middle of Devil's Lake, North Dakota. Mr. T. H. Hubbell and I were crossing in a motor boat from Minnewaukon Bay to Creel Bay, when we noted the animal in the water a half-mile or more from the north shore, and also about a half-mile from the south shore. It was swimming with apparent ease toward the north shore, and was making rapid progress. When secured, the individual proved to be a fully grown female."[24]

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[23] Journ. Mamm., Nov., 1919, pp. 12–13.

[24] Journ. Mamm., Aug., 1921, p. 170.

Habits

The Badger is a winter-sleeper, a "seven-sleeper," the country folk say.

As late as Nov. 4, 1884, I found a Badger active above ground. The fresh snow was plentifully marked with its tracks, showing where it had gone about sniffing at all manner of Ground-squirrels' holes, seeking those that gave token of inmates sleeping below. In New Mexico, this animal is active all the year round, but in Manitoba, as soon as the ground freezes, it goes below, and sleeps through the winter without any store of food other than its fat, until, in April, it is again roused to life. It generally appears above ground as soon as the snow is gone.

In the early days of Manitoba, before the fence and the plough had come, the traveller on the prairies might see, a dozen times a day, a whitish bump on a raised mound of earth not far from the trail. As he approached it, the white bump might develop a sharp and movable point at one end, the point would sway in the wind, then the white thing disappear into the earth, showing that the bump was simply a Badger taking his daily sun-bath.

They rarely go far from their holes, and when they do, they are much alarmed by discovery, and go shuffling about to each promising place in search of a road to the friendly shelter of mother earth.

Once I overtook one in the open plains in Arizona. He scurried around, but could find no hole, so faced about; and as he made short leaps toward my companion, I caught him by the only safe handle—his rough, strong tail. But possession seemed to satisfy the hunter's instinct, and once we had conquered him, we freed him and left him in peace.

On another occasion, in June, 1897, on the Upper Yellowstone, I met a Badger waddling over the prairie. I had a camera with me and, meaning to get a picture, ran after him. To my great surprise, he came rushing toward me, uttering a low snarling. Fully believing in my ability to avoid his attack, if, indeed, he really meant to make one, I continued to run, when, just as we were within 30 feet of each other, he fell tail-first into a shallow Badger hole that he had not seen, and I fell head-first into another I had not seen. We both were greatly surprised, quite shocked indeed, but he recovered first. He scrambled out of his pitfall, ran 10 feet nearer to me, then dived down his home-hole, toward which he had been making from the first.

Those who know the Badger of Europe, have little idea of the life of the prairie species. The former seems to live much like a Skunk, trotting

about at night, above ground, seeking its food in the woods and thickets, retiring to an underground home to rest during the hours of daylight. But the prairie Badger spends the greater part of its life underground, where it digs, feeds, sleeps, and multiplies, much like a Mole. It rarely comes out during the day, except to bask in the sun by its doorway, and then is ready to plunge below at the slightest alarm.

Deep underground, this animal is safe from violence. It is hopeless to dig after it, for it can burrow like a Mole; it is stopped by nothing but a few barrels of water sent suddenly after it. This shuts off our digger's wind, and forces it to the surface to breathe and meet its adversaries.

On one occasion, I ran after a Badger on the prairie, and just as I neared him, he plunged into a hole that was but 3 feet deep. I seized his tail as he was digging it deeper, and tried to haul him out, but he braced himself with both fore feet, and defied my best efforts. Water was at hand, but a couple of bucketfuls thrown in merely caused him to swell out his body till it plugged the hole, and no water whatever passed him to get near his head. A spade handle, however, pushed between him and the wall, let the flood down with a sudden "gulch," and the Badger was forced to turn about and wage unequal fight.

As a Fighter

The Old World Badger has long been famous as a fighter, and the prairie species seems no whit behind its cousin. It is so strong that a man cannot pull it out of its hole if once it gets fairly braced. It is so protected by its thick, loose-fitting hide, that a bulldog may be holding it by the scruff of the neck without in the least shutting off the Badger's wind, or preventing its operating with teeth and energy on any or all four quarters of its pre-occupied assailant. Its jaws are so strong that it usually leaves a gash at each bite, and its courage such that it *never* surrenders, no matter how numerous or strong its assailants. It dies fighting to the last. A 15-pounder would be a large one, and any Dog twice the weight would surely be worsted by the Badger.

In my Journal for 1892, I find this note:

"*July 27th.* This morning at Carberry, a Badger was pitted against 4 large Dogs on the open prairie, and he beat them all off, escaping almost unhurt. The Badger was aggressive as soon as a Dog came near him. He continually uttered a sort of hissing, also grunted like a Pig. As a matter of fact, it was a bloodless battle, consisting of little but noise. The Dogs seemed afraid to close in. When taken back to the stable, the Badger drank a large quantity of water. Where does he get it when home?

The following is contributed by J. R. Stringham, of Holden, Utah: "Two years ago, I followed the tracks of a Badger in the snow and found where it had had a fight with two large Coyotes. The snow was about 16 inches deep, and the battle had been long and fierce, the Badger apparently being the winner, for he had retreated to his den, about 2 miles distant, without the loss of blood, while the Coyotes had lost blood and had made but short distances between the places where they had stopped to lick their wounds and to rest."[25]

Social Instincts and Amusements

So far as I have seen, the Badger is a solitary animal, leading a somewhat sordid life, minding its own business, but confining that business to the least elevating of pursuits.

The British Badger has the reputation of being remarkably sociable and frolicsome. G. E. Blundell, of Bristol, tells me that in England the native Badgers have a sport which he has often observed. At sundown, the members of the family repair by a well-worn pathway to a low trunk or stump, and there play a sort of "King of the Castle" game, each one trying to climb up or pull the others down. They indulge in this for an hour at a time. It has no connection with the sex feelings, as old and young take part as soon as the latter are strong enough. The fact of there being a fixed place and apparatus, is of special interest, and ranks this amusement with the sliding of the Otter.

In the May of 1913, I was staying at Chillingham Castle, Northumberland, England. The keeper told me of a place where the Badgers assembled by night to indulge in their social games. There were plenty of Badger tracks about, and I made a number of sketches of the playground, which have a suggestive bearing on the subject of this chapter.

But alas! I had seen nothing of such an engaging habit in our own species, and regretted that though such a fine animal, it was to be placed much lower in the scale of development than its congener. Later, however, I was glad indeed to find Paul Fountain's account of the Badger. He says: "On bright moonlight nights, I have watched them for hours gambolling and playing like Dogs."[26]

Thus, as in every case, the more we learn of the animal, the more claim it has on our sympathy and interest. To the casual glance, the wild animal is a fierce, elusive creature, occupied chiefly with eating and running away. It is only on getting gently nearer that we realize the other half of its life,

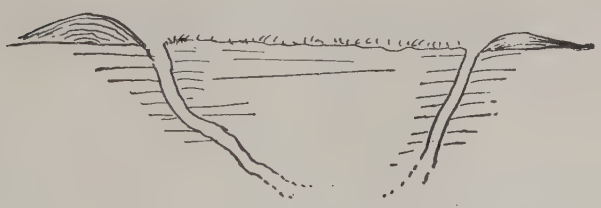
[25] Mamm. Utah, 1922, p. 136.

[26] Great Northwest, 1904, p. 40.

PLATE XLVIII.—BADGERS IN ZOO

PLATE LI.—CANADIAN BADGER

Right fore and hind foot of Badger (life size)
Taken in Colorado, Sept. 7, 1901



Badger hole, 6 feet deep
Carberry, Man., July 25, 1892

PLATE LIII.—BADGER PADS AND DEN

the side which shows love for the mate, its young, and the pleasant society of its own kind.

That the Badger has a sense of fun, I have many times seen. In the Washington Zoo, for example, the female Badger there will play for half an hour at a time with a stick, catch it, throw it, stalk it, pounce on it, etc., much as a kitten will with a ball.

W. B. Bell writes me that he had a Badger kept as a pet for several years. "While young, it was as playful as a puppy, but at times was perhaps somewhat too ardent in its playful nips at trouser legs."[27]

Among the many unwritten chapters of this brave and sturdy creature's life, is one on the meaning and use of the highly developed anal glands. I once watched a tame Badger that was tremendously impressed and allured by the blacking on a pair of newly shined shoes. He gambolled after the wearer in the same sort of ecstasy that a Cat manifests over catnip or valerian, and continually rubbed his anal glands on the delectable shoes. What is back of this, is something for the young naturalists to discover. I suppose it has relation to some system of intercommunication, like that used among Wolves.

The Badger does not neglect the vocal modes of thought transmission. The species has many sounds that it uses in expression. Unfortunately, only those used in battle have been recorded,—the hiss, the grunt, the growl, and the low husky snarling, which seems to show that the snarler is a little afraid of the one it is snarling at.

As recognition marks, or signal service apparatus, the black and white face spots are no doubt important, for they announce its species to all the wise world that can see.

Just how all these things and codes are used, is not known, because they belong to the gentle side of the Badger's life, and all our observations so far have been of the bitterly hostile kind.

Friendliness

Many of our quadrupeds are known to form curious, apparently platonic, friendships with totally different creatures. The British Badger has frequently been found living in good fellowship with a Fox, and, on several occasions, our own comfortable species has been accredited with a similar partnership, which shows that he is much the same all-round good fellow as his British cousin twice removed. The first cases were friendships with Coyotes, and were recorded by A. H. Hawkins, the surveyor.

"During the progress of my survey," he says, "in southern Alberta,

[27] Personal letter, Sept. 30, 1925.

I noticed on two occasions a Badger and a Coyote travelling in company. The same thing was observed and reported by the men who did my mounding on three different occasions, all of which were in different localities.

. . . . . .

"Seated one day, eating our noon lunch, I noticed two animals coming towards us, and drew the attention of my men to the fact. We remained perfectly quiet, so that they came within 20 to 30 feet of us before seeing that we were so near. The Coyote travelled ahead, and the Badger followed along as fast as he could, right at the heels of the Coyote.

"I could see no reason, nor could I explain it in any way satisfactory to myself, and, although I asked several people in the West about it, the occurrence is still a mystery to me."[28]

Some similar cases have been reported to me by G. A. Rimington, of Penrith, Eng. Several times, near Calgary, in 1907, he saw a Badger and a Coyote associated, and travelling together. In these cases, it seemed to be a partnership affair, which was probably involuntary on the part of the Badger. No doubt the Coyote knew very well that the Badger would dig out Ground-squirrels, some of which would bolt and thus give the Coyote a chance to share in the spoils.

In exactly the same way, the Badger is followed by hawks, etc., in California, as graphically described by Mary Austin in "The Land of Little Rain." (1904, p. 152.)

But the most remarkable case of all is a friendship between a Manitoba Badger and a lost boy. This was related to me by George Fraser, a native of Manitoba, and corroborated by his mother, Mrs. Fraser, of Kildonan, and Archbishop Matheson.

In 1871, a little seven-year-old boy, named Harry Service, wandering from his father's house at Bird's Hill, near Winnipeg, was lost for two weeks. When found, he was living in a den with a Badger. His clothes were torn so that he was nearly naked, and his face was all scratched. He told his parents that he had taken shelter in the hole during a rainstorm, and that the Badger came later and scratched his face. At first they fought, but the child was plucky, and would not give up the hole. Later the Badger brought some food and, after another quarrel, allowed the child to eat some of it. In the days that followed, the Badger brought him food several times. The beast always entered the den by one of the entrances not used by the child. When found, the two were on terms of friendship, and the child cried bitterly when taken from his savage friend.

[28] Ottawa Naturalist, May, 1907, p. 37.

PLATE LIV.—SCATOLOGY OF CERTAIN MUSTELIDAE (ALL NATURAL SIZE)

a. Wolverine, October, 1908.
b. Badger, October, 1908.
c. Skunk, October 10, 1908, chiefly remains of grasshoppers and wasps, but in this case also the tail feathers of a small bird, Cos Cob, Conn.
d. Fisher, April 28, 1905.

The boy's story, however, was not clear. He said at one time that he lived on mud. His face, mouth, and tongue were black with mud, and much swollen. Nevertheless, his description of the Badger was beyond question. He even said it had five toes on one foot and four on the other.

References for Badger

1859—Quadrupeds of Illinois, by Kennicott.
1905—Mammals of Northwest Territories, by Roderick MacFarlane.
1908—Preliminary List of Wisconsin Mammals, by H. H. T. Jackson.

LIFE XXVII—THE SKUNK

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Common Skunk, Big Skunk, Alaska Sable, Black Sable, Striped Skunk, Smell-Cat, Two-Striped Skunk, Sachet Kitten, Mephitic Weasel, American Polecat, Big Polecat, Wood Pussy

Mephitis mephitis (Schreber)

(L. *Mephitis*, a poison gas.)

Viverra mephitis Schreber, 1776; Säugthiere, pl. 121.
Mephitis mephitis Allen, 1902, *Science*, n. s., Vol. 16, p. 115, July 18.

Type Locality—Eastern Canada, i. e., Quebec

French Canadian, *l'Enfant du diable; le Chinche; la Mouffette; la Bête puante.*
Cree, Ojibway, and Sauteaux, *Shee-gawk.* In this, we see the origin of the word "Chicago," meaning "Skunk-land."
Yankton Sioux, *Mah-cah.*
Ogallala Sioux, *Mah-kah.*
Chipewyan, *Nool-tsee-a.*
Huron, *Scangaresse* (Sagard-Théodat).
Abenaki, *Seganku* (Rasles). The word "Skunk" is traced to the last two Indian words.
Mexican, *Zorilla.*

The Skunks belong to the Weasel Family (*Mustelidae*) and to the subfamily *Mephitinae* which is divided into three principal groups:

Big Skunks, genus *Mephitis* Geoffroy and Cuvier.
Spotted Skunks, genus *Spilogale* Gray.
Hog-nosed Skunks, genus *Conepatus* Gray.

The genus *Mephitis* (Geoffroy and Cuvier, 1795), are about the size of a common House-cat; have short ears, long fur, very large and bushy tails, are black in colour, with a thin white stripe on the face and a broad one beginning on the nape, forking on the shoulders to reach to the hind quarters or sometimes nearly to the tip of the tail; they are at least partly plantigrade, and have the fore claws very large and suited for digging; but above all, they have greatly developed anal glands which produce the liquid musk that they eject with such notable effect in self-defense.

The teeth are:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{3-3}{3-3}\text{; mol. } \frac{1-1}{2-2} = 34$$

In addition to these generic characters, the Skunk has:

Size. Length, about 28 in. (711 mm.); tail, 10½ in. (267 mm.); hind foot, 3¼ in. (82 mm.).

Weight. A full-grown ♂ Skunk in my menagerie, April 25, 1925, weighed 5½ lbs., a yearling 3½ lbs., 7 ♀'s (*M. nigra*), respectively, 4, 4, 4, 4, 4¼, 4½, and 6 lbs. The last two were 2-year-olds, the first 5 were yearlings. I have had several breeding ♀'s that weighed only 3 lbs.

A large ♂ which I weighed in the Yellowstone Park, July 29, 1897, was 8½ lbs.; another, a winter specimen, taken in Iowa, weighed 7¾ lbs. In my menagerie, I have had several males that tipped the scales at 10 lbs. These were of the large northern race *hudsonica*, and came from Winnipeg.

On Oct. 2, 1883, while travelling on the prairies near Rapid City, Man., I shot an enormous Skunk who commanded me to "stop and go around." Alas, I had no means of accurately weighing him, but I was a strong young man at the time, and I know my hand holding his hind leg (he was too long to lift by the tail), was tired out before I got him to the wagon 200 yards away. I set his weight at 30 lbs. An old settler with me, a man accustomed to "hefting hogs," said: "No, he don't weigh much over 20 pounds." These, of course, were "hunters' guesses," but I feel sure now, that this old warrior was well over 15 lbs. in weight; especially as I note Allan Brooks says of the British Columbia Skunk (*spissigrada*), during the salmon run: "They then get very fat, the ordinary weight of an adult then being 10 to 16 lbs."[1]

At birth, they weigh about half an ounce; at 8 weeks, 1½ lbs.

Colour. General colour black, with a thin stripe down the face between the eyes, and the usual white nape from which a broad white, or creamy white, stripe goes back to the shoulders, where it forks and continues along the sides into the tail, which is of black hairs with white bases, and ends usually in a white tuft or pencil. There is, however, endless individual variation, especially in the length of the back stripes.

Their *black and white colour*, with their size, their slow movements, and their *immense bushy tail*, usually held aloft, will distinguish the true Skunks from any other animals found in North America.

Brown or cream-coloured freaks of most kinds of Skunks have been found.

---

[1]Recreation, June, 1900, p. 434.

Races

Taking Howell's *Revision* as our starting point, the following forms of *Mephitis* have been recognized:

mephitis Schreber, the typical form. A large animal, with tail short and slender; palate ending in an even curve without notch or spine. T. l., Eastern Canada.

hudsonica Richardson, size very large; with two long white stripes the whole length of body; tail heavy, and of medium length, ending in a blunt brush without a white pencil or tuft; skull heavy, with a long palate; zygomata broadly spreading. T. l., Plains of the Saskatchewan.

minnesotae Brass, a large form, "darker than *hudsonica*, but browner than *mephitica*." T. l., forested region of Minnesota.

nigra Peale and Beauvois, size medium; tail longer than in *mephitis*, and black, with a distinct white pencil or tuft. Often is of the all-black style, known as "star black." Skull short and broad with a prominent spine at the back of the palate. T. l., Md.

elongata Bangs, size medium; tail very long, marked with white on the sides, and with a long white pencil or tuft; markings variable, but white stripes usually very broad. T. l., Micco, Brevard Co., Fla.

mesomelas Lichtenstein, size very small; tail short, usually wholly black; skull small and narrow. T. l., Louisiana.

avia Bangs, resembles *mesomelas* very closely, but skull slightly larger. T. l., San Jose, Mason Co., Ill.

varians Gray, size large; tail very long; markings similar to those of *hudsonica*, and very constant; skull longer than that of *mesomelas*. T. l., Texas, probably lower Rio Grande Valley.

estor Merriam, size rather small; tail shorter than in *varians;* much white on body and tail: skull like that of *varians* but smaller. T. l., San Francisco Mt., Ariz.

occidentalis Baird, size large, much like *hudsonica*, but tail longer; skull narrow. T. l., Petaluma, Sonoma Co., Calif.

spissigrada Bangs, like *occidentalis*, but with shorter tail, and more white on body and tail; palate short without notch. T. l., Sumas, B. C.

notata Howells, like *occidentalis*, but tail shorter; skull and dentition heavier; body stripes very narrow, and separated for the entire length. T. l., Trout Lake, Skamarina Co., Wash.

major Howells, similar to *occidentalis*, but much larger; hind foot longer; skull larger and heavier. T. l., Fort Klamath, Klamath Co., Ore.

holzneri Mearns, similar to *occidentalis*, but smaller. T. l., San Isidro Ranch, Lower Calif., near border of San Diego Co., Calif.

platyrhina Howells, externally like *occidentalis*, but skull peculiar, with very broad rostrum. T. l., South fork of Kern River, 3 miles above Onyx, Kern Co., Calif.

macroura Lichtenstein, size medium to small; build much slenderer than in *mephitis;* tail very long; hairs on nape elongated and spread into hood. Two types of colour; one all above white and all below black; other nearly all black, but the under surface of tail white. T. l., Mountains northwest of the City of Mexico.

milleri Mearns, like *macroura*, but larger, with heavier skull. T. l., Fort Lowell, near Tucson, Pima Co., Ariz.

vittata Lichtenstein, a very small edition of *macroura*. T. l., San Mateo del Mar, Oaxaca, Mexico.

The last three together are usually referred to the subgenus *leucomitra*, and considered races of one species, *macroura*.

Notwithstanding their great variation, and the fact that the last three constituting the Hooded Skunk group (*leucomitra*) have been considered subgenerically distinct, all are Big Skunks, closely akin in anatomy, and identical in habits, so far as their varying surroundings will permit. This one Life, though founded chiefly on *mephitis*, may be considered, in the main, applicable to each and all in the group.

History

The earliest known account of the Skunk is by F. Gabriel Sagard-Théodat, who published in 1636 his famous "Histoire du Canada." On page 748 he makes a statement which may be literally translated as follows:

"The children of the devil," he says, "that the Hurons call *Scangaresse*, and the people of Montagnais, *Babougi Manitou*, or *Ouinesque*, is a very strong-smelling beast, of the size of a Cat or of a young Fox, but it has the head a little less pointed, and the skin covered with a thick fur, rough and smoky, and its big tail turned back over itself; it hides itself in winter under

the snow, and does not come out until the beginning of the moon of the month of March, which the Montagnais call *Ouiniscon pismi*, which means the moon of the *Ouinesque*. This animal, besides being of very bad odour, is very malicious, and of an ugly appearance; they drop also (so it is said) among their excrements, little serpents, long and slender, which, nevertheless, do not live very long."

Range and Records

The Big Skunk is strictly an American product. It is found in every part of the United States where there is dry land, and on northward through Canada as far as Great Slave Lake, and southward covering all Mexico as far as Guatemala. The map broadly indicates this vast range, but it must not be inferred that the species is equally distributed throughout. In a 200-mile belt of forests across from northern British Columbia to Maine, the Skunk is very scarce, and at one time possibly unknown.

These facts are set forth in detail as follows: For New Brunswick, A. Leith Adams, *Field & Forest Rambles;* for Nova Scotia, Gilpin, "On the Mammalia of Nova Scotia"; for Maine, J. J. Audubon, *Journ. Mamm.*, Nov., 1924; Manly Hardy, *Forest & Stream*, May 21, 1910; for Gaspé, G. G. Goodwin, *Journ. Mamm.*, Nov., 1924; for Labrador and Quebec, O. Bangs, *Amer. Nat.*, July, 1898; for North Ontario, North Manitoba, and Mackenzie, E. A. Preble, N. A. F., 22; for North Saskatchewan, Alberta, and British Columbia, R. MacFarlane, Mamm. N. W. T.; for Mackenzie, B. R. Ross, Mamm. Mack. River.

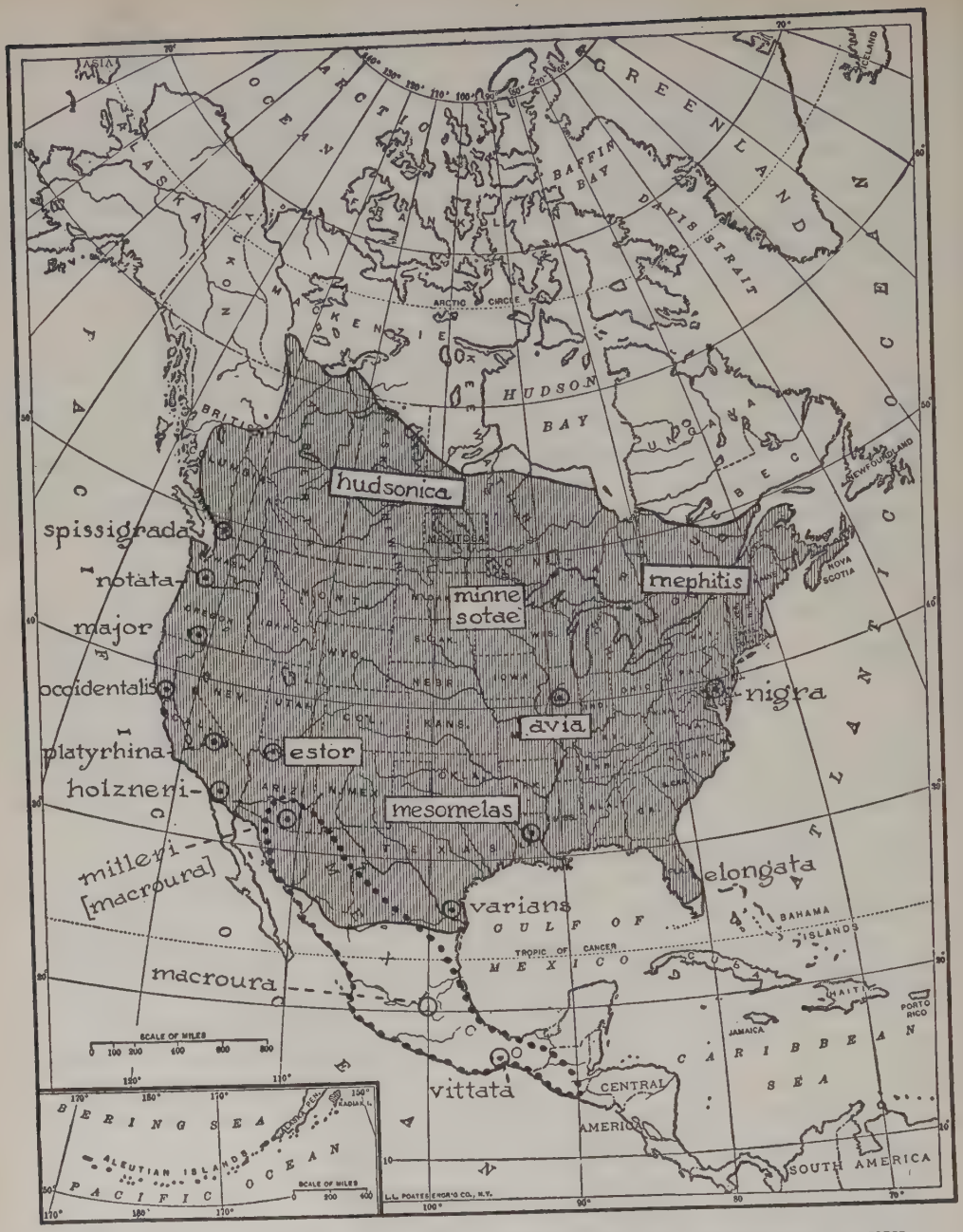
The species is not recorded from the coast region of British Columbia or from Vancouver Island.

In the vast region that includes the northern parts of Alberta, Saskatchewan, Manitoba, Ontario, and Quebec, the Big Skunk is regularly distributed, but somewhat rare. This belt is indicated on the map. It is virtually the Canadian Life Zone. South of that, the species is common. North of this, in the Hudsonian Zone, it is unknown; and on the south, it does not enter the Tropical Zone, except in one small area of southern Mexico, with a long point reaching into Guatemala.

Haunts and Home Range

Dense pine forests, rugged mountains, or flat, arid plains have no charms for the Big Skunk. Like most of his congeners in these Lives, he loves variety—dry, rolling land, well watered, and alternated with sun and shade. In open fields, mixed with dense cover, he finds his ideal home.

This is one reason why he has rather increased with settlement, that



MAP VI.—RANGES OF THE COMMON SKUNK AND OF THE HOODED SKUNK

By E. T. Seton, with assistance of the Biological Survey

Range of the Common Skunk, chiefly in the United States and Canada.
Range of the Hooded Skunk, chiefly in Mexico, is in dotted outline; at one point, it overlaps that of the Common Skunk. It appears in three races: *macroura*, *milleri*, and *vittata*.

is, with the breaking up of the dense forest in many regions. On the plains, too, he has held his own, for the farm has increased the food supply, and in an underground den, he finds a safe and ever-handy refuge.

If I wished to find Skunks in a region quite new to me, I should look for the tracks and signs wherever there were banks and open glades not far from a stream.

Nevertheless, the rich grown prairies of Manitoba, Minnesota, etc., are well supplied with Skunks, for there food abounds, and the necessary cover is furnished by the long grass or the plentiful burrows of Badgers, etc., as well as those that they themselves dig as often as they need them.

The home range of each individual is very small. The creature's powers and mode of life, preclude the possibility of its roaming far afield. I have often followed its tracks in the early or late snow, from the den through many places and adventures in quest of food, then back to the den, to learn that at no time did it go more than 200 or 300 yards from home. In warm weather, because more active, it may go farther, but this is doubtful, because food is more plentiful then, and it is still less forced to travel. I believe a half-mile radius would reach the Ultima Thule of its ordinary wanderings.

In discussing its home range, Enos A. Mills says: "The territory over which Skunks hunt or ramble for amusement is about 1,000 feet in diameter. Rarely were tracks 500 feet from the dens of the several families near me. But twice a Skunk had gone nearly a mile away; both of these were outings, evidently pleasure trips and not hunts."[2]

In the British Columbia Mountains, according to Allan Brooks, Skunks "will cover 4 to 8 miles in their nightly peregrinations,"[3] which might easily be within half a mile of the den.

Numbers

The Skunk has long been recognized in commerce, for its definite annual contribution. Therefore, it is possible to get some idea of the annual kill of the species by mankind; that is, those that are in prime fur—fur fit for market.

Besides this, the Skunk has been listed and persecuted as vermin in some misguided communities—all of which is helpful in the way of providing records that cover large areas.

In Arizona, according to Herbert Brown of Pima Co., the Legislature in 1908 passed a bounty bill or scalp act, offering $1 a head for every Skunk

[2] Watched, p. 36.

[3] Recreation, June, 1900, p. 434.

killed in Arizona. Each county was to meet its own skunkage. During the two years that the law was in operation, "not less than 50,000 Skunks (including Little Spotted and Hog-nose) were killed in Arizona. . . . The result threatened to almost bankrupt some of the counties."[4]

The accounts are incomplete and sketchy, but in the 4 counties, Yavapai, Cochise, Gila, and Yuma, totalling 28,339 square miles, 17,138 Skunks were killed, which works out at about 1 Skunk to 1½ square miles; and evidently plenty left.

In the California National Forest (1,600 square miles) 459 Big Skunks were killed in the season of 1920, and the reports were not all in at the time of printing. This would give one Skunk to 4 square miles, not counting 25 Spilogales taken, or the large number still left at large.[5]

The average number of young seen with the mother in the fall is 2, or not more than 3; the litter at birth is double as many. This shows that the destruction of the very young by Coyotes, Foxes, Badgers, owls, eagles, etc., is very high.

As will be seen below, the annual catch of Skunk pelts in Canada for 1919 to 1922 inclusive was more than 100,000. This means a destruction of at least 200,000 per annum. My contention is that, under the most favourable circumstances, the species cannot stand an annual drain of 50 per cent. But they are standing this; therefore, it is less than 50 per cent. of the population; which, in this case, must be at least 400,000 in Canada. This area is less than one fifth of the creature's range; which argues a total population of not less than 2,000,000.

There are many parts of the Skunk range where 1 per square mile is quite a likely rate; and large areas where it must be less. The entire range is about 5,000,000 square miles; therefore, a conservative estimate of the Skunk population is 3,000,000.

Fur Trade, Fur, and Flesh

In 1887, according to the Trade Reports published by the Hudson's Bay Company and C. M. Lampson & Co., 632,794 Skunk skins were disposed of at the annual auction sale.

According to the official fur reports of Canada, the catch of marketable Skunks in the 3 years, 1919–20, 1920–21, 1921–22, was respectively 120,132; 74,972; 133,342 pelts, an average of 109,462.

During the 58 years, 1848 to 1905 inclusive, the Hudson's Bay Company collected 302,564 skins of this species, an average of 5,216 for each

[4] Forest & Stream, Dec. 2, 1911, p. 811.

[5] Cal. F. & G., April, 1920, p. 89.

year. The lowest were 0 in 1849 and 1,263 in 1848; the highest, 12,583 in 1889. The average for the 10 years, 1895 to 1905, was 9,425.

Poland's lists show that during the 34 years, 1858 to 1891 inclusive, 9,765,442 skins were taken by the other American companies, an average of 287,218 each year. So that the average annual catch of Skunk for fur up to 1891 was about 300,000. But this has been greatly increased during the last 30 years.

A complete list of the sales in London for the 16 years, 1900 to 1915 inclusive, is given by the U. S. Biological Survey. It shows an average catch in America of 1,204,723 per annum; the maximum was 2,009,465 in 1911; the minimum, 615,000 in 1915.

The Winnipeg market quotations, March 26, 1904, were 25 cents to $1.

At the London annual fur sales, held at Lampson's in March, 1906, there were sold 445,051 Skunk skins, chiefly from the United States. The highest price realized was 11 shillings ($2.64) each for a superb lot of 233 A1 black skins. Inferior skins went as low as 2 shillings or 3 shillings (48 cents or 72 cents). The ruling price for first-class skins was 8 to 9 shillings ($1.92 to $2.16).

During the great fur boom of 1920, prime black Skunks sold at from $2 to $6. Though lower at present, there is no likelihood of so good a fur ever dropping considerably, or of going out of fashion.

The fur of the Skunk is deep, rich, glossy, intensely black, and on a skin that makes strong and durable leather when dressed. In other words, it is an ideal fur. But it was sadly discounted by the fierce and persistent smell. The increasing demand for all furs, especially black ones, and the successful abolition of the dreaded smell by new methods of killing, and by the disarming of Skunks on the Skunk ranches, has met the handicap of discount. Skunk no longer has to be marketed as "Alaska Sable," but is proudly blazoned forth as "real Skunk," and is climbing steadily in public esteem, which means also in commercial value.

The Skunk is regularly eaten by Indians and trappers. Provided the animal met sudden death and was not too old, the flesh is white and tender, and probably well flavoured. I never tried it.

Merriam says: "The flesh of the Skunk is white, tender, and sweet, and is delicious eating. It is more like chicken, but is more delicate, and its taste is particularly agreeable. Being, happily, free from any of that 'squeamishness' which Audubon and Bachman lament as preventing them from tasting the meat of this animal, I am able to speak on this point from

ample personal experience—having eaten its flesh cooked in a variety of ways, boiled, broiled, roasted, fried, and fricasseed—and am prepared to assert that a more 'toothsome bit' than a broiled Skunk is hard to get, and rarely finds its way to the table of the epicure."[6]

It is in the purpose of this book of Lives to discuss each animal in its relationship to man, the service that it renders or can render, living or dead. So I enter these experiments on *Mephitophagy*, without personal interest or experience. I suppose that under some circumstances, I might essay such a meal, but, as at present-minded, it would seem to me a little too much like eating a baby.

Cannot Climb

One of the most important recent natural history books, dealing in part with American animals, was unfortunately blemished by a good picture of our Big Skunk climbing about among the high branches of a tall tree, evidently quite at home.

This was an error, for every country boy in America knows that a Skunk cannot climb a tree any more than a Pig can. Yet I have been surprised once or twice to find that a Skunk can climb to any height on a mesh-wire fence or cage.

In my menagerie, I have a strong woven wire cage about 8 x 12, and 10 feet high, the roof, as well as the walls, being of heavy wire netting. One of my Skunks, with a spirit of enterprise and a sense of humour, developed an exciting game out of this. Hooking his long claws in the upright wire, he quickly scrambled to the top, and walked about on the outside of the roof.

The occupants of the cage were two large Montana Bobcats. Their hunting instincts were aroused by the sight of this food-possibility walking about on their roof. They bounded up from the floor, clinging to the wall or hanging back-down from the roof, as they made futile slaps and snatches at "Funny John," who dodged about on the roof, quite safe and ever out of reach, but hugely enjoying the sport. For this Skunk was blessed with an unusual joy in antics, from which, indeed, he got his name.

One of my largest and best Skunks—a Winnipegger, and the mother of Beauty, Tip, and Specklecap—escaped in an unexpected manner. By climbing 7 feet up the straight wire front of a cage, she got to a 4-inch ledge on the outside fence. Following this some 20 feet, she was able to reach a sloping tree on the outside, down which she scrambled or tumbled. And I saw her no more. She was pure *hudsonica* in type, so that the next generation of taxonomists must not be frightfully upset if, in a series of Con-

[6] Mamm. Adir., p. 76.

necticut skulls, they find some that do not accord, some that show perplexing evidence of Saskatchewan affinities.

These instances of climbing are, however, the rare exception. Ordinarily, a 3-foot fence, if it be smooth boards or sheet iron, is quite enough to confine the creature.

Not Afraid of Water

On several occasions, I have seen that this animal has little hesitation about taking to water.

On May 23, 1882, while travelling near Turtle Mountain, Man., I surprised a Skunk in the open; he turned to face me, but stones were plentiful, and my range was longer than his, so he ran off. I followed and, each time he faced about, I drove him on with handfuls of pebbles, till he was routed, and fled with unusual haste. Too much so, indeed, for he ran on to a long spit of land that projected into a small lake. At the margin he hesitated, but a new shower of pebbles urged him forward, and he took to the water, swimming for a low island in the middle, 50 yards away. When he got there, it turned out to be nothing but floating weeds. This was a sad disappointment; he turned to swim back to the shore, but stones showered in the water stopped him. He was forced to cross the lake, here 100 yards wide, and very cold. When he reached the bank, I was there to meet him. But he was much numbed and lay almost lifeless. Now I took pity on him and pulled him out; he made no attempt to defend himself, but tamely submitted. I carried him by the tail to a warm sunny nook, and there left him to recover in peace. This he no doubt did, for I now suspect that he was not so far gone as he seemed, but, finding that his customary defense had failed, was skilfully playing 'possum.

The Skunk is not usually said to be aquatic, but on Oct. 2, 1883, I saw 5 Skunks dabbling in the mud along a pond near Minnedosa, Man.; and Miller Christy, in his paper on the "Mammals of Manitoba," says:

"One evening last June, I assisted in the extermination of a family party—of Skunks—consisting of an old one and 6 young ones, which were taking a bath at the edge of the lake. The Skunks seemed to be fond of the water, as on another occasion, I remember shooting one from a boat as he was nearby bathing."[7]

Similarly, Preble relates of the Keewatin Skunk: "While paddling up the channel between Windy and Pine Lakes, on Sept. 12, we saw a Skunk swimming across the stream, 100 yards in front of our canoe. On seeing us,

[7]Nat. Hist. Journ., May 15, 1885, York, Eng.

he redoubled his exertions, but we overtook . . . him just as he reached the shore."[8]

The Smell Gun

The Skunk is famous the world over for its "smell gun." This has nothing at all to do with the urine, as vulgar error would have it, nor with the reproductive organs. The fluid is a liquid musk, secreted by two large glands under the tail. All of the Weasels are provided with these, but they reach their glorious perfection in the Skunk, and furnish it with a wonderfully effective weapon of defense. The glands are situated on each side of the anus; the two ducts from them are ordinarily hidden away within the rectum, but can be protruded for service, much like the gun of a submarine. The musk is a clear, limpid fluid, of golden-yellow colour, with an intensely acid reaction, and, as attested by several observers, is slightly luminous.

Dr. John D. Godman says: "We are informed by our friend, Mr. T. Kearney, that on one occasion, while going to visit a trap before daylight, he disturbed a Skunk which was running along the path at some distance in advance of him, and was much surprised to observe that the course of the fluid discharged was rendered perfectly visible by a distinct *phosphorescent* light; the odour left no doubt of the animal whence it proceeded."[9]

According to Bachman, "At night, it has a yellowish luminous appearance; we have noticed it on several occasions, and can find no more apt comparison than an attenuated stream of phosphoric light."[10]

It has several other properties of interest. Those who have never smelt it may realize some of its power if they imagine a mixture of strong ammonia, essence of garlic, burning sulphur, a volume of sewer gas, a vitriol spray, a dash of perfume musk, all mixed together and intensified a thousand times. This will give a faint, far, washed-out idea of Skunk musk, of which the active principle is a sulphide called *mercaptan*.

This is the ammunition of his defense, and woe to the unhappy creature that has foolishly made himself a target for this battery. If it reaches his eyes, it produces instant and painful blindness, usually temporary, though I have heard of cases where it was permanent. If it enters his nostrils, it causes swelling of the mucous membrane, frightful and disabling, choking; as it enters his lungs, it often sets up a fearful and unspeakable nausea, sometimes causing convulsive fainting.

A fighting Weasel gives off a small imitation of this, and those who

[8] N. A. F., 22, p. 65.

[9] Amer. Nat. Hist., 1842, I, pp. 156–57.

[10] Q. N. A., I, p. 323.

know the rank smell of a Fox at his worst will have some knowledge of the *kind* of smell that Skunk musk is; but in the 10,000th dilution.

It is so strong that under certain circumstances, it can be smelled for miles down wind. I remember one summer evening at Carberry, Man., being greeted with the powerful odour in great and sudden force; next day I found that at that time, a Skunk had been defending himself against a Dog on the open prairie, one and a half miles to windward of me.

A brief, but impressive description of the smell's power is furnished by E. L. Brown, who dug out some warlike Skunks in the north of Minnesota on the Pembina trail in Nov., 1897:

"I would scorn to boast," says he, "but, nevertheless, our Northern-Minnesota Skunks are the best Skunks in America. They can smell harder, farther, and longer, and do it oftener, than any others that I have personally sampled. . . .

"When digging out [Skunks from] a deep hole, so the scent was confined within a small space, the effect on the lungs was like the fumes of sulphur. The sensation would last for several hours."[11]

"Dr. W. B. Conway reports a case where roguish schoolboys caused one of their number to inhale from a 2-oz. phial an unknown quantity of Skunk perfume. The effects produced were fainting, muscular relaxation, a temperature of 94 and pulse of 65, together with cool extremities. The respiration and pupils were normal. . . .

"The patient remained for one hour in a state of total unconsciousness. During that time the Doctor administered small quantities of whisky at short intervals, having some difficulty in getting him to swallow. He finally aroused, suffering no inconvenience from its effects except a slight headache, which passed off after a good night's sleep."[12]

Discussing the effect on the eyes when assailed by the spray, Merriam says: "We have reliable accounts of the entire loss of vision from this cause."[13]

Sir John Richardson in 1829 wrote: "Mr. Graham [Thomas Hutchins] says that he knew several Indians who lost their eyesight in consequence of inflammation, produced by this fluid having been thrown into them by the animal."[14]

As a proof that blindness does not always follow a shot in the eye, note the following: In 1912 one of my keepers, a reckless old soldier, took a pitcher

[11] Recreation, May, 1898, p. 363.

[12] Virginia Med. Month., Aug., 1881, pp. 359-60, in Mamm. Adir., p. 77.

[13] Mamm. Adir., p. 78.

[14] F. B. A., I, p. 55.

of milk to a new Skunk—a wild one—that was, moreover, of unusually bad temper. The keeper rudely and noisily slammed open the lid of the den. The startled Skunk threw back her tail and fired at short range, hitting him squarely in both eyes.

With wonderful presence of mind, the keeper held on to the milk, and washed his eyes in it again and again. In an hour he could see a little, and in three days was wholly recovered. Similar punishment was meted out to C. H. Merriam and S. N. Rhoads, as is later told.

Nevertheless, I know from many personal experiences, during the process of disarming my Skunks, that a drop of it on your fingers or face burns like vitriol.

Merriam contributes the following in point: "August 10, 1882, while removing the scent glands from a young Skunk, the contents of one of the sacs was suddenly and unexpectedly discharged, striking me full in the right eye. For a time the pain was intense, but I immediately and thoroughly washed out the fluid by pumping water into the open eye, and the conjunctival congestion that ensued, subsided in a few hours. But in this case, the fluid was not nearly so strong and irritating as that from the adult animal."[15]

The terror of the Skunk is on bird and beast, and Hudson tells at great length of the South American Skunk repelling the attack of a bird of prey with a single shot. He also gives details of a huge Dog that was no match for a Skunk. The Dog would face a bull or a Lion, but was mortally afraid of the Smell-cat. After much urging, Hudson one day got the Dog to rush on a Skunk. The first shot of musk tumbled the Dog over as if dead, but he got up, crawled away to hide in the muck of a swamp, and to be a sick Dog for many days.[16]

Its Range and Rapidity of Fire

The distance to which the spray can be thrown usually is 6 to 8 or, in exceptional cases, according to my observation, perhaps 10 feet.

Bachman, however, says, in discussing the point: "We measured the distance on one occasion, when it extended upwards of 14 feet."[17]

If the Skunk is approached on the windward side, the distance is greatly reduced, and *vice versa*.

The number of times he can shoot, and the quantity of musk given off, varies greatly with the size of the Skunk and the period elapsed since

[15] Mamm. Adir., p. 85.

[16] Nat. La Plata, 1895, pp. 121–23.

[17] Q. N. A., I, p. 322.

last he used it. Ordinarily, each of the two sacs contains enough for 5 or 6 rounds, and if emptied in a battle with many foes, would probably need a week to fill up again.

Thus the Skunk's famous breech-loader is also a repeater; and all flesh —Dog and wild things, as well as men—with one accord prefer to let the Skunk alone. They will endure a terribly hard pinch of hunger before inviting a volley from the "Smell-cat's" famous gun.

Rhoads has some interesting observations on the number of rounds that a Skunk carries in its belt, as well as the accuracy of its aim.

He was on a natural history trip in Clinton Co., Pa., in 1898, and writes: "The trap set yesterday among the rocks for a Porcupine, contained Skunk No. 4. As usual, it had eaten the caught foot off, up to the jaws of the trap. No odour was perceptible. It could get just far enough under the rocks to hide all but its extreme hind parts, and there the trap held it. Perched upon a high boulder, directly above and out of range of the excited animal, I was master of the situation. At this juncture, a loosened stone rolled against its hind leg in such a position as to receive the full force of the resultant discharges. As the stone made no objection, and the air was clearer for its service, I let it alone until the magazine should be exhausted, meanwhile watching the process of expulsion and nudging the beast with a stick to expedite matters and test its powers of manipulation. Perhaps it fired off a tablespoonful under these conditions, and then the stone was removed, and a closer inspection made of the movements of the depleted glands. The animal could discharge from the right or left teat separately, according to the side touched, in such a way as to foul the stick in nearly every instance, whether above or on either side of the orifice. . . . When the supply of fluid was exhausted, it ejected with decreasing power, a dense yellow substance, which appeared to be the dregs of the normal fluid, resembling drops of curds. These amounted to about $\frac{1}{4}$ ounce before the supply was exhausted, and were not expelled more than 1 foot from the glands.

"This experiment was of great interest in its conclusive proof of the independent action of the glands, their mobility and capacity for intelligent directive effort on the part of the Skunk, and the ability of the animal to work his battery intelligently against an invisible enemy."[18]

A more pungent illustration is the following by Mrs. Rhoads who for obvious reasons kept the record. Rhoads had trapped a Skunk and, believing that the animal was paralyzed by a back-breaking blow, carried the trap and prisoner campward. Mrs. Rhoads now tells on him: "Coming to a flat rock, he determined to end its sufferings; so, placing the outfit on a

[18] Forest & Stream, Jan. 14, 1899, p. 26.

rock, he began to hold the beast down with a forked limb until he could set foot on the right place to suffocate it, when, lo, the nerve worked! Not blindly nor at random, but most accurately did it work. With a sudden right-angled twist of its body, the poor beast shot the lovely yellow fluid into my husband's eye and well over his left side."

To which Rhoads himself adds, long later: "When my vision returned, I could not refrain from jotting down a few items on the affairs. . . . I have proved that an *Enfant du Diable* can fire his gun at an angle of 90 degrees to his lumbar vertebræ and hit a man fair in the eye quicker than a wink."[19]

I have more than once seen persons draw near the Skunk with little fear, because the animal was face on, and tradition hath it that the gun points backward, and is used only in Parthian fight. But this turns out at once to be a grave error. The Skunk throws its brush forward and to one side, bends down its back, protrudes the anus, and the pipe of the gland then shoots the dreadful liquid toward the foe, with fearful precision. As a matter of fact, I think the Skunk rarely fires straight backward. Its gun can be trained in any direction or at any elevation, but it prefers to aim at a foe that it can clearly see.

Usually it is careful to keep its coat and tail clear of the fluid; it never deliberately shoots without elevating the tail and clearing the gun-deck.

Cannot Shoot if Hung by Tail

There is a widespread belief among naturalists that the Skunk *cannot* shoot unless his feet be firmly planted on the ground, and his tail bent at an acute angle to the back.

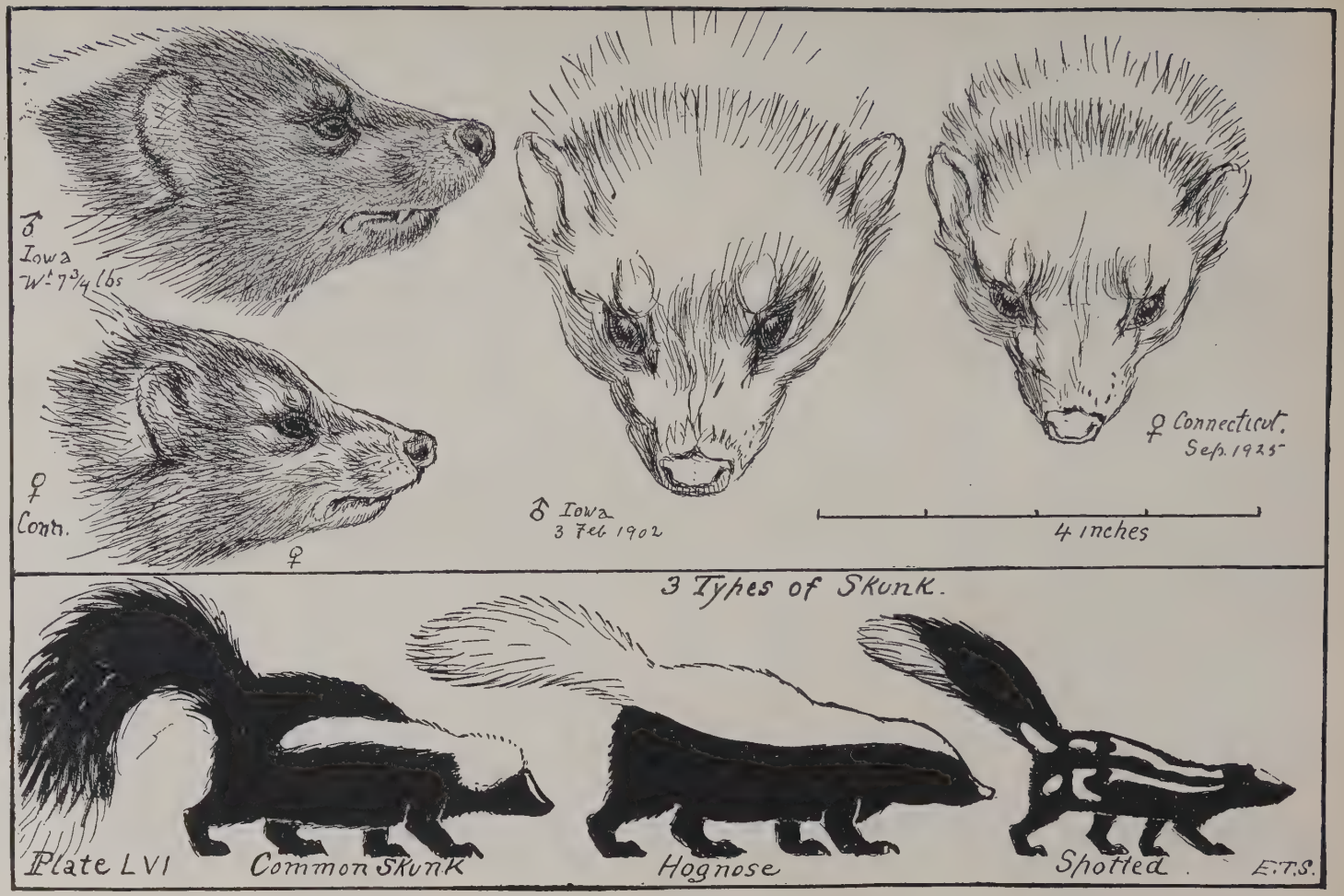
Merriam does not accept this view, and in support of his dissent, gives the following incident of his own childhood in the Adirondacks.[20] He happened to seize a Skunk by the tail as his Dog seized it by the head, and yet was shot full in the face, mouth, and eyes. After a week, he recovered.

Before accepting this incident as conclusive evidence, we should remember that possibly none of the conditions were complied with; that is, it was not, in any complete sense, a test case. If the little Dog held the Skunk by the head, and the child held it by the tail, the animal's feet were probably on the ground or on the box, and the angle of the tail unknown.

A parallel instance is furnished by W. J. G., an experienced trapper, who writes: "I have recently lifted a Skunk by the tail without anything

[19] Forest & Stream, Jan. 14, 1899, pp. 25–26.

[20] Mamm. Adir., p. 84.


♂
Iowa
Wt. 7¾ lbs
♀
Conn.
♀
♂ Iowa
3 Feb 1902
♀ Connecticut.
Sep. 1925
4 inches
3 Types of Skunk.
Plate LVI
Common Skunk
Hognose
Spotted
E.T.S.

happening. The Skunk does not seem to be able to shoot unless his feet are on the ground, or have a bearing on something else.

"I remember once, a friend of mine picked a Skunk up by the tail and held him for me to kill, which is done by a sharp blow from a stick across the back just above the hips. The Skunk was squirming considerably, and I struck it across the shoulders instead of the small of the back, bringing all four of its feet on to my friend's chest. There was an immediate discharge which caught my friend in the neck. He has held no more Skunks by the tail for me to kill."[21]

In this, it is clear that the Skunk's feet were planted on the man's body, taking the weight off his tail, which would at once take the angle required for defense.

E. L. Brown, describing the method he and his pal used in digging out the Mighty Smellers of North Minnesota, says: "Often one of us would pull a Skunk out of a hole by the tail, giving it a throw, while the other deer-hunter would strike it with a club, in the most approved style of baseball practice. Apparently the animal could not 'throw scent' when held by the tail."[22]

Referring to the rule that the tail and spine must form an angle, or the Skunk cannot shoot, S. N. Rhoads says: "Let any one who is skeptical of this rule, and has not been favoured to closely observe the glands of a Skunk in action, manipulate the battery of a dead animal. As the tail is drawn at right angles to the back, the movement likewise acts automatically in protruding and constricting the scent glands, one on either side, and in exposing the teats of these glands, so that they may be directed backward at the will of the animal in the normal position for a discharge. The raising of the tail in itself cannot cause a discharge. It is analogous to the cocking of a gun; the pulling of the trigger depends on the volition of the animal. An artificial discharge may be performed on the dead animal by raising the tail and applying external pressure upon the glands. Reversing the movement, the glands retreat, the pressure upon them relaxes, and when the tail is at an angle of about 40 degrees, they are entirely concealed, rendering an external discharge impossible."[23]

In *Forest & Stream*, for Nov. 14, 1908, p. 773, is an article by Julian Burroughs, "Fun with a Skunk," in which he tells of his father carrying three wild Skunks by the tail, and yet was not fired at. The article is illustrated with a picture of John Burroughs in the midst of the performance.

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[21] Forest & Stream, July 4, 1908, p. 11.

[22] Recreation, May, 1898, p. 363.

[23] Forest & Stream, Jan. 14, 1899, p. 25.

Finally, I have scores of times seen armed Skunks held by the tail on various fur ranches, without any discharge following, and a dozen times, at least, I have done it myself.

Big Medicine

Any one from another land, reading these various testimonies to the power and terror of the Skunk, might hastily assume that the Skunk can have the whole country to himself if he wishes it, and by all sound reasoning, he should so wish.

The evidence has been carefully sifted. Some testimony that savoured of exaggeration, has been thrown out; nothing is here presented that I do not know or believe to be true. And yet no Skunk rancher, no trapper, is in mortal terror of a Skunk. His attitude is practically that of a snake-charmer who continually handles rattlesnakes. He knows perfectly well the fearful risk he runs, but is so familiar with every habit, move, and impulse of the creature, knows exactly how they strike, when, and why; so that the mastery of experience is on him. He knows just what to do and what not to do; and he rarely suffers. The element of fear is important.

A further factor in the case is the immense range of individual variation in the Skunk weapon and temper, and, still more, in the men who handle him.

To me, Skunk musk, if very dilute, is rather agreeable. Sometimes, in disarming a big Skunk, without anæsthetic, I have had him fire. He did not hit me, because the patient is always kept blindfolded, so he cannot aim straight. The atmosphere around was saturated with the spray, but it had no effect on me. I have had my stomach upset by Fox musk, but never by Skunk.

Dr. C. Hart Merriam tells me that he also has this indifference to Skunk musk, and says of it: "It is powerful, pungent, and penetrating, to be sure, but is not one-tenth part so disgustingly nauseating as the secretion from the corresponding glands of many other members of the *Mustelidae*, and particularly of the Mink and Weasel."[24]

In a similar vein, John Burroughs writes: "It is a rank, living smell, and has none of the sickening qualities of disease or putrefaction. Indeed, I think a good smeller will enjoy its most refined intensity. It approaches the sublime, and makes the nose tingle. It is tonic and bracing, and I can readily believe has rare medicinal qualities."[25]

The medicinal virtues had already been pointed out by Merriam, who

[24] Mamm. Adir., p. 78.

[25] Squirrels and Other Fur-bearers, p. 51.

believes the fumes an "efficacious remedy in certain spasmodic affections of the air passages, such as asthma, whooping cough, and spasmodic croup. It certainly deserves more extended trial, but, unfortunately, its offensive odour is a practical bar to its general employment."[26]

Nevertheless, it has been used not a little. Dr. John Bachman writes: "Professor Ives, of New Haven, administered to an asthmatic patient a drop of this fluid three times a day. The invalid was greatly benefited; all his secretions, however, were soon affected to such a degree, that he became highly offensive both to himself and to those near him. He then discontinued the medicine, but after having been apparently well for some time, the disease returned. He again called on the doctor for advice—the old and tried recipe was once more recommended, but the patient declined taking it, declaring that the remedy was worse than the disease!

"We were once requested by a venerable clergyman, an esteemed friend, who had for many years been a martyr to violent paroxysms of asthma, to procure for him the glands of a Skunk; which, according to the prescription of his medical adviser, were kept tightly corked in a smelling bottle, which was applied to his nose when the symptoms of the disease appeared.

"For some time he believed that he had found a specific for his distressing complaint; we were, however, subsequently informed that, having uncorked the bottle on one occasion while in the pulpit, during service, his congregation, finding the smell too powerful for their olfactories, made a hasty retreat, leaving him nearly alone in the church."[27]

His Inoffensiveness

Most human beings armed with a weapon of offense so powerful that none dare face it, are apt to become arrogant with power, to degenerate into bullies and tyrants. The Skunk is as far as possible from such behaviour. His natural sweetness of character has never deserted him in his "glut of power." He continues the gentlest and least aggressive creature in the woods.

Like the rattlesnake, he gives fair notice, and acts only on the defensive. Let the Skunk alone, and he will let you alone. When approached by an enemy, the peaceable Smell-cat usually makes off, ambling deliberately, evidently unwilling to provoke attack. If the enemy follow and overtake him, as a man may easily do, he turns and faces about, and seems to say, "All right, if you *will* have it, come on." But he still gives you three fair

[26] Mamm. Adir., p. 78.

[27] Q. N. A., I, p. 323.

warnings—which is almost scripturally correct; the first, by facing about and stamping; the second, by raising and spreading the tail, all but the tip, which hangs downward. The third final and dreadful warning is, when the tip rises up and spreads out. That white flag nailed to the mast does not mean "surrender," but "clear the deck for action." Then you look out! Stand perfectly still! Make no sudden move; it may not yet be too late! The Skunk, especially if an experienced old fellow, may change his mind, haul down the fighting signal, mast and all, forgive you, and go quietly away. A young hunter or a young Dog is likely to rush forward at the beautiful, innocent-looking animal, and, just as he is about to seize it, is sure to get the charge of blinding, poisonous spray, after which the Skunk will turn and go on its way rejoicing, quite confident that that enemy is permanently routed.

I have had many tame Skunks, some of them in full possession of their powers, and rarely have had cause to rue the adoption of such unfragrant pets. Still, there was always danger of strange Dogs rushing in unwittingly, and provoking a round of the irresistible "scatter-gun."

One of these Skunks was killed by a meal of very strong cheese; this was always thought to be a rare tribute to the strength of that particular brand. His final death struggle culminated in a grand discharge of his battery, a parting salute to the earth and his friends, and the cheese.

While I was living in a shanty at Yancey's in the Yellowstone Park, in 1897, a family of Skunks made their home under the floor. They came out every evening to pick up scraps about the door, or climb into garbage pails in search of eatables. They would even venture into the house when the door was left open. But no one molested them, even the wise old Dog refrained, and would walk stiffly away, with head in the air, pretending he did not see them. So that the summer passed without offense.

Late one evening, I caught a couple of them in a box trap in order to keep them till the light was better, that I might take their pictures. The Skunks watched me setting the trap, then waddled into it without loss of time and were caught. However, among the revolver-carrying mountain men who loafed about, I could not find any one brave enough to help me in carrying the box full of Skunks over to the place where they were to be photographed. I might have had trouble, but that my wife volunteered, and the process of immortalization was duly carried out next day at close range. More than once, the Skunks gave warnings No. 1 and No. 2, but I apologized by remaining still, and signal No. 3 was not hoisted, nor had our pleasant acquaintance any rupture.

Near Toronto, July 5, 1888, I had an interesting adventure with the

Ontario Skunk. Two men in my employ, called my attention to an old Skunk and two well-grown young ones that were walking across a field. I told the men to do as I did, then took a stout board, and ran after one of the "Smellers." He ambled off but, finding me close on him, he faced about and made ready for action. I approached, holding the board in front of me. When I was 7 or 8 feet away, he fired over his own head. I jumped, and the shower reached the spot whereon I had stood. Before he could get another charge ready, I rushed at him, pushed his tail down, with the board laid on his back, then, slipping a hand under each end, I caught him by the neck and the tail, and carried him in triumph to a box. The men tried to do the same, but both got badly "skunked," especially the one who attacked the mother. She made good her escape, but the other young one was put in a box with his brother. This adventure cost me two suits of clothes.

These Skunks I gave to Dr. W. Brodie. He kept them in his yard in Toronto, and for some months had no reason to regret it, until one day a neighbour's tom-cat conceived the brilliant but unhappy thought of dining on one of the "Smellers." The results were many, the Cat was temporarily blinded, and the neighbour brought the police, so that ultimately we were compelled to dispense with our Skunks as pets inside the city limits.

A Contradiction

Although Skunk musk is so potent as to nauseate many animals, to choke some, and blind others, it is a curious fact, as every hunter knows, and I have often seen, that a hound, while running a Rabbit, may run into a Skunk, and be so soaked with the musk that he flies in agony to the nearest stream to roll in the mud and wash his burning eyes and nostrils. Then, within ten minutes, though still stinking unspeakably, he will take up the faint Rabbit trail again. I do not know how to explain this.

A discussion on the subject took place in the pages of *Forest & Stream*. The letters were headed "Blended Odours." The following from the pen of W. Wade is of value: "I really believe that any keen-nosed Dog can get the worst sort of skunking, and be just as fit to trail as before the malodorous calamity. Most certainly I know that foxhounds have done it within my own observation, and I remember distinctly Doctor Hill's Ginger getting horribly skunked, and within ten minutes picking up a Fox trail that half-a-dozen other hounds had passed over; and in this particular instance, I perfectly remember that the old hunters did not think it was anything peculiar, saying, 'Any good hound will do that.'" (April 24, 1897. P. 332.)

In direct contradiction to this is an observation by the anonymous

author of the Skunk article in Doughty's "Cabinet of Natural History." He says: "In one instance while hunting woodcock during the month of August, one of my Dogs encountered and killed a Skunk before I could approach the belligerents, and from the effects of the fetor received in battle, he was rendered entirely useless for a whole year, and did not recover the goodness of his nose for nearly double that time."[28]

Persistence

The persistence of this mighty smell is much what might have been expected from its force. The records abound with instances of it. One of the old classics is from Hearne: "I cannot help observing," says he, "that the fœtid smell of the latter [Skunk] has not been much exaggerated by any Author. When I was at Cumberland House, in the Fall of 1774, some Indians that were tenting on the plantation, killed two of those animals, and made a feast of them; when the spot where they were singed and gutted was so impregnated with that nauseous smell which they emit, that after a whole winter had elapsed, and the snow had thawed away in the Spring, the smell was still intolerable."[29]

Any one wishing to investigate for himself, can do so at one of our great museums, where they have stuffed Skunks and Skunk skins. In spite of every precaution and disinfectant, these retain the famous odour for years.

The superb quality of its shiny black fur led many women into wearing it, but in spite of various kinds of treatment, the penetrating odour was there.

> "Ye may break, ye may shatter the vase if ye will,
> The odour of roses will cling to it still."

And if, as often happened at some fashionable "tea," where women wore their furs, it came on one of those close, warm, or damp days so well known in London, the stimulating effect on every Skunk skin present, often resulted in an atmosphere which caused an early break-up of the gathering.

The fearsome reputation of the smell has in many cases played on the imagination of the observer. On one occasion, one of my young and disarmed pets escaped. Next week it turned up in a neighbour's field. He, with amazing courage—as he told me—and with no weapons other than clubs and stones, *faced it alone* and did it to death.

Knowing of my interest in animals, he brought me the poor mangled

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[28] Vol. II, 1830, p. 194.

[29] Journey, 1795, pp. 377–78.

little body. He held it by the tail at arm's length, and held his own nose with the other hand. His face was contorted with horror and disgust. He said: "Don't it smell awful? It makes me sick." I held the limp, furry body to my nose to make sure he had not found a wild one. It had no more smell than a well-kept kitten—not the faintest suggestion of Skunk musk.

In my boyhood days in Toronto, Canada, there was a current legend that, years before, a Skunk had wandered into town and been killed on the southeast corner of Pembroke and Gerard streets. On damp nights, it was easy to perceive the undying odour of the creature on that very spot. As a child, I used to linger near, and go out of my way to enjoy it, for it made a marvellous appeal to my wildwood instincts. The fact that it later turned out to be nothing but a leakage of sewer gas, can never rob me of the joyous thrills and memories of those long-gone times.

It is often said that clothing once skunked will smell for ever. This is a mistake: the odour is strong and durable, but can be destroyed. The usual method is to bury the tainted garments. But a better and simpler way is to send them to the cleaner—provided he will accept them—and there the benzine or gasoline method may be relied on to destroy all traces of the "child of the devil," as our French neighbours call the Skunk.

The Penalty of Power

It is a law of nature that power and responsibility go hand in hand; they cannot be divorced. Each forms half of an arch; without one, the other goes crash. Another law—a form of the same—and unwritten, therefore irrevocable—is this: A power or function unexercised, is remorselessly cancelled.

This is where these principles bear on our Skunk. He has evolved a marvellous, a nearly irresistible, repeating gun. No creature can face its terrors; it is his all-sufficient protection; and, relying on it more and more, he has abandoned the other inheritances of his race: the speed, the agility, the strength, the climbing power, the cunning, the war spirit, the courage, the alert senses, the wisdom, the swimming power, the digging power, that are the continued salvation of Marten, Weasel, Wolverine, Otter, Mink, and Badger. Each and all of these had the possibility of smell-gun protection, and each and all, by some obscure law of nature, were estopped. So they have not bartered their other gifts for the single one of immunity from open attack.

Lycurgus was wise and right when he forbade the building of a wall around Sparta. Secure behind a wall, he foresaw that his people would

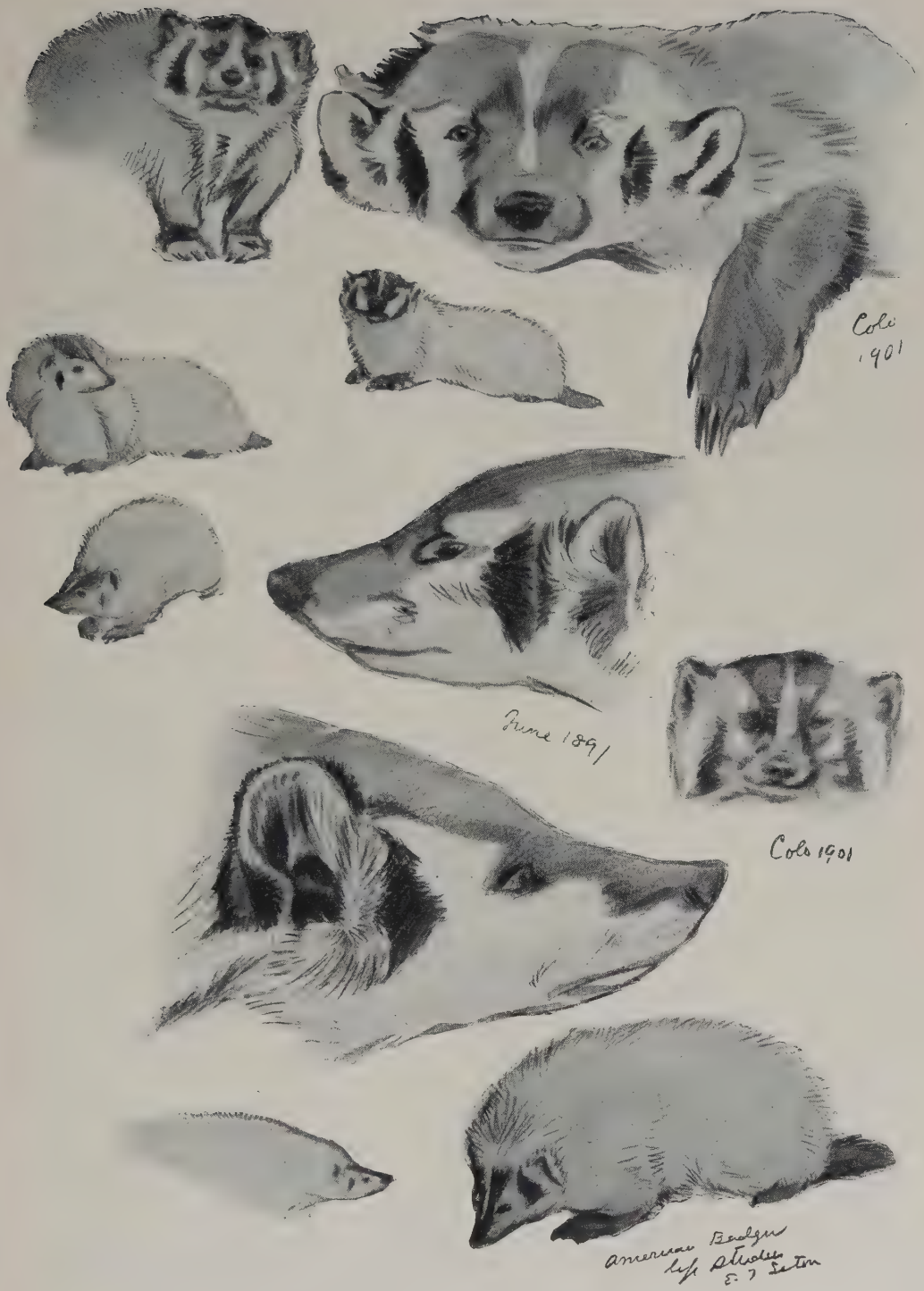


PLATE LII.—BADGER STUDIES FROM LIFE

PLATE LV.—MOTHER SKUNK AND HER BROOD

become unvigilant, lazy, degenerate. The continual need for preparedness and watchfulness, he knew would act as a perpetual rejuvenator.

What an awful price, then, the Skunk has paid for his power! But is he wrong? What is the sum total of result? Is he less happy for his reduction of gifts? Every one of the kinsmen above cited, who have clung to their manifold talents, have passed, or are passing away; the Skunk alone continues and flourishes in every part of his ancient range. Who will show us the way of wisdom?

Not only has he lost speed, ability to climb a tree, and keen wits, but also, he has become slow and stupid; satisfied with himself, and utterly unsuspicious. Foxes and Wolves have a sort of inborn knowledge and distrust of gins and springles, no matter how carefully they are concealed. Nothing seems capable of inspiring the Skunk with such helpful discredence. He will go blundering right into the most obvious of traps, even after seeing a brother taken there the night, yes, the hour, before; yea, even if he himself hath already been caught therein; pitfall, deadfall, steel or box trap, it is all the same to the Skunk—in he goes. And the fool pays the price of his innocence.

Disarming the Skunk

To forestall the dreadful possibility of a shot from this deadly battery, the Skunks on fur farms are usually disarmed when very young; that is, when about a month old. At that time, it is easily done. There is no smell and no danger. But after they are 6 or 8 months old, it is quite a serious operation.

There are four different ways of disarming: (a) by snipping off the nipples inside the rectum so that adhesive healing follows, permanently sealing the fluid in; (b) by cutting the ducts deep in near the sacs; (c) by pulling the sac out through the orifice that the nipple covers; (d) by totally cutting out both glands from the outside. There are grave objections to the first three. The last is the only one now followed by the experts on the fur ranches.

In the kittens a month old, it is easily done without any smell, and apparently with but little pain. In the adults it is much more difficult. The creature has to be rolled up in a sack so that it is blindfolded as well as manacled. The operator usually empties the sacs by mechanical pressure, then proceeds without risk.

The two cuts are treated with antiseptic and in a few days are healed. Very rarely are any lost except when one uses anæsthetic. That seems to be more fatal in its after-effects than the operation.

These methods are fully set forth in pamphlets listed among the reference works.

Social Side and Vocal

So far as known, Skunks have no social life. They have no games that they play together. Their only gregarious impulse seems to be that of assembling in the winter, many in one hole, for the sake of warmth rather than for comradeship.

Their winter gatherings are probably family affairs, and the large winter groups of twenty that have been recorded, were probably the accidental association of two families, allured by an exceptionally attractive den—possibly one that in former times had served both families for a nursery.

In this limited sense only, is the Skunk sociable and gregarious.

The monstrous bushy tail and the black-and-white pattern are no doubt direction and recognition marks that are well known to the live creatures of its region. Day or night, they notify all the world: "I am a Skunk; no one can hurt me with impunity." The wild folk do not fail to profit by this blazonment of the fact, and thus, incidentally, the Skunk is saved a deal of unprofitable exertion.

Abbott H. Thayer, I learn, takes the contrary view. He believes that the markings of the Skunk are intended to hide it from its prey, by breaking up its breadth of black. But its prey is chiefly insects, and taken on the ground, so that Thayer's explanation seems unsatisfactory, all of the Skunk's peculiar markings being on its back where the insects are not likely to see them.

It is ordinarily a very silent animal, but it utters a low "churring" or scolding sometimes, when it is disturbed, without being much excited, and I have heard one growl as it seized on a grasshopper. Its battle cry is a shrill screech, and often I have heard it utter a birdlike twittering. It sometimes expresses anger or defiance by stamping with its front feet, and its loud sniffing at curious or strange objects, is an expression of interest fully comprehended by its fellows.

The Skunk's Song

The following from Miss Zilpha Chase of Taunton, Mass., opens a field of investigation that should be kept in mind.

"*Oct. 3, 1909.* Two weeks ago, a Skunk was trapped and shot on our place. Two nights after, for four consecutive nights, just before dawn, we were awakened by a beautiful cooing whistle. It began high, and gradually became lower and more guttural, growing to a coo-coo and finally ending in

a soft purr like a Cat. It seemed to be on the ground close to our house. It was so dark, we could see nothing, and we did not dare investigate, for we had heard that a Skunk made a cooing sound. Some of the neighbours thought it might be an owl—a cat-owl—but it did not seem to me that an owl would sing while on the ground. I thought it was the call of the Skunk's mate who had tracked him or her. We found a Skunk's excretions every morning in our yard.

"*Oct. 9th.* It may interest you to hear that one of our friends has had a similar experience. For some nights after a Skunk was shot on her place, about 9 P. M., a cooing as of pigeons was heard, only louder. They threw some sticks toward where the sound arose, and there was a scuttling in the grass.

"One of my friends living in Lakeville says several years ago, she heard often what her husband, now dead, called the call of the Skunk. She thinks my imitation is correct. However, I am not yet satisfied, but am still hunting.

"*Oct. 15th.* Charles Herrick, a farmer of great experience, who lives in the midst of haunts of Skunks, in North Raynham, says that my supposition is *correct;* that it is the love note of the Skunk. His daughter is one of my pupils, and she says it is very common around them."

Two years later, having read my description of the Skunk's cries and calls, she added:

"Now imagine that squealing and churring purified and beautified into the love song, in a clear whistle. Oh, I do hope you may hear it sometime —and soon. Since writing you, I have heard from a farmer in Middleboro, praising the beauty of the song, and stating that it is common."

I have heard from my Skunks a great variety of snarls, growls, churrs, squeals, and a curious twittering, but never anything that, owing to its modulation or circumstance of production, might be called a song. Nevertheless, a sentient being, with a voice, good vocal organs, and strong love impulses, ought, by all the rules, to have a song. Therefore, it is well to suspend judgment, pending fuller investigation and light.

The Food

If teeth, family customs, ancestral tradition, and vulgar reputation prove anything, the Skunk is a carnivorous animal—a killer of innocent birds and beasties, a foe to the peace of a sanctuary. Is he? Apparently not.

Wasps. Every investigator of Skunk diet is impressed with the creature's penchant for wasps, that is, wasps' nests and all that in them is.

In my Journal for Sept. 22, 1909, I find the following note, showing the preference of the Skunk: "A Skunk family has been about all summer. The home is under my east line fence. Five yellowjacket nests, and many other ground insects, have they dug out. Their dung is nearly all remains of grasshoppers and crickets, with a few cherry pits. My gardener has tried in vain to catch them with chicken heads and box traps. But they pass them unnoticed. Obviously the chicken meat is a mere emergency ration with the Skunk. His choicest food of all is insects."

Many times I have followed the foraging travels of a Skunk, to find that, in that night at least, his principal food was yellowjacket wasps and their comb, with its contents of juicy wasplings and their nursery trappings.

Any one who has seen a pack train of Horses and men put to ignominious and disastrous rout by one little nest of yellowjackets, may wonder how the undefended Skunk can enter and destroy their very citadel, without dire calamity befalling him.

The answer was revealed to me some 40 years ago, when I was a youngster travelling on foot with gun and blanket in the wilds of newly settled Manitoba. Although in late July, nightfall came with a cold, driving rain. We, my old friend Miller Christy and I, tramped quickly on, looking for a shelter. We came at last to a stubble field, for we were nearing the confines of settlement. In the field, we found an old binding machine, evidently there since last year. Under its low, broad table, prepared to receive the grain as cut, we crouched, found protection from the rain, and, with our blankets, put in a not bad night. The only thing that disturbed us was an occasional loud buzz under us as we lay. These buzzes increased with dawn; then, at daylight, we had suddenly to bundle out in great haste to avoid the onslaught of an army of yellowjackets on whose home we were lying. It was very cold, and they could scarcely fly at this hour, so we suffered little or not at all. Had it been hot when the light appeared, we might have had a very different story to tell.

Thus, I learned the lesson that yellowjackets are harmless and helpless at night. So that our friend the Skunk, prowling after their nests in the meadows, is absolutely protected by the black darkness. He kills and slays without possibility of reprisal from them.

Grasshoppers. "In July, August, and September," says Lantz, "when grasshoppers are most abundant, they constitute the chief food of Skunks, which consume enormous quantities. During the disastrous invasions of the Rocky Mountain locust in the plains country in 1873 and 1874, the Skunk was reported as the principal mammal that destroyed these insects. As other species of grasshoppers are always abundant, and sometimes ex-

tremely destructive to crops, the constant services of Skunks in checking their increase should not be forgotten."[30]

Doctor Merriam, detailing the food habits of his pet Skunk, "Meph," says: "We used to walk through the woods to a large meadow which abounded in grasshoppers. Here 'Meph' would fairly revel in his favourite food, and it was rich sport to watch his manœuvres. When a grasshopper jumped, he jumped, and I have seen him with as many as three in his mouth and two under his fore paws at one time. He would eat so many that his over-distended little belly actually dragged upon the ground, and when so full that he could hold no more, would still catch and slay them. When so small that he could scarcely toddle about, he never hesitated to tackle the large and powerful beetle known as 'horned bug,' and got many smart nips for his audacity. But he was a courageous little fellow, and it was not long before he learned to handle them with impunity, and it was very amusing to see him kill one. Ere many weeks, he ventured to attack a Mouse, and the ferocity displayed in its destruction was truly astonishing. He devoured the entire body of his victim, and growled and stamped his feet if any one came near before the repast was over."[31]

There are other pests besides bugs and rodents for whose destruction we are continually indebted to the Skunk. The worst of these is, I believe, the snapping turtle. This malignant reptile of the duck ponds, takes probably half of the young ducks hatched each year in its range. Any creature combatting successfully the snapper should win the gratitude of every sportsman.

On the Skunk, the honour is fallen. He is a most effective snapper-killer, not by assault on the big grown snapper, but by digging out and destroying the eggs.

Dr. A. K. Fisher has given details that show the value of Skunks in this department. An extensive marsh in New York State swarmed with aquatic life. There were snapping turtles, but they were not overnumerous, for the Skunks kept them down by destroying the eggs. Then came a boom in Skunk fur. Practically all the Skunks were trapped. The snappers became so numerous that the ducks raised almost no little ones. But a drop in the value of Skunk fur reduced the trapping, so the Skunks once more increased, and the normal balance was restored.[32]

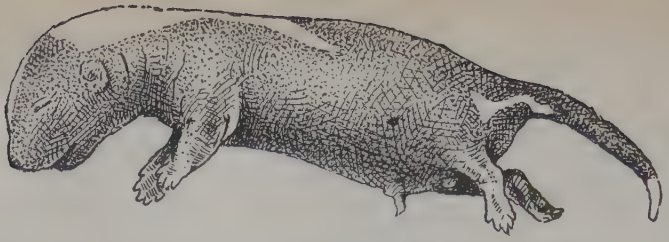
The best available analysis of the Skunk's food habits is by the U. S. Biological Survey, from whose published report[33] I condense as follows:

[30] Skunks, p. 13.

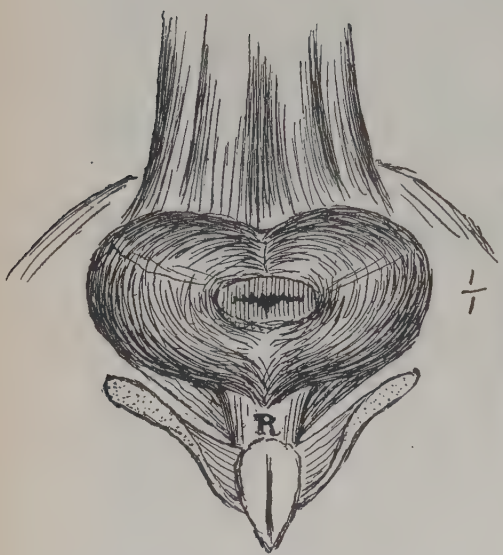
[31] Mamm. Adir., p. 74.

[32] Yearbook, Dept. Agri., 1908, pp. 191–92.

[33] Lantz, Skunks.



Young of *M. nigra* just before birth (life size). Weight 15 grammes
Cos Cob, Conn., May 12, 1908



Anal scent-gland of *M. nigra* ♀ dissected and raised to expose the rectum (R). (Life size, but a very small example)
Cos Cob, Conn., Oct. 12, 1908

The right front and right hind paw of Hudsonian Skunk (life size)
Taken at Marshalltown, Ia.

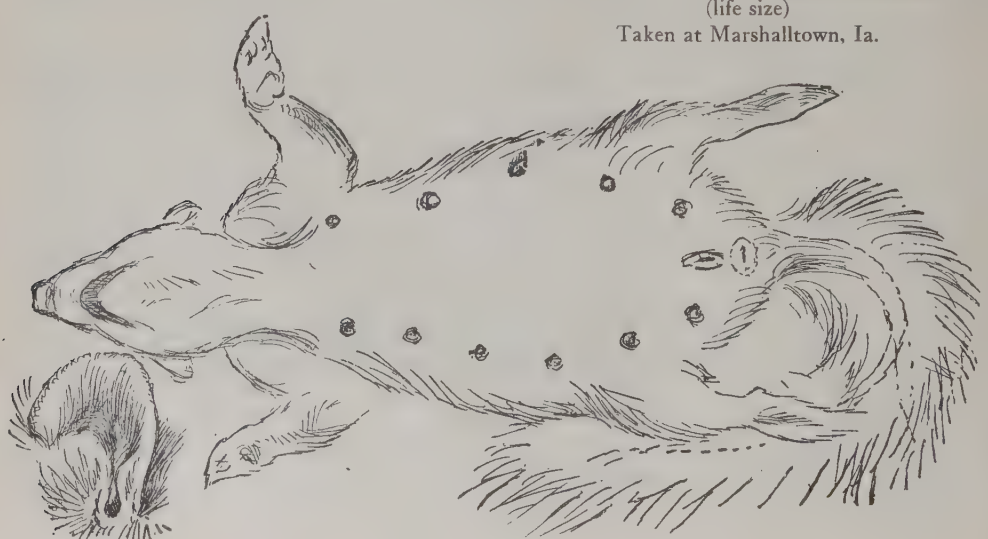


PLATE LVIII.—DETAILS AND MASTOLOGY OF SKUNK

Illustrated by specimen of *M. nigra*. Cos Cob, Conn., May 12, 1908
This one weighed only 3 lbs., yet contained 6 young near birth. The aggregate weight of the young was about 3 ounces

First, these are the noxious habits ascribed to the Skunk, and the answers filed by the defense:

The Skunk kills game. Yes, he occasionally takes eggs or callow nestlings and Rabbits, but only during the breeding season, and then but little, for other food abounds. At other times, he cannot catch them.

The Skunk kills poultry. Not if it be properly housed at night, for he cannot climb, and only the rare pervert Skunks indulge in this habit. Kill him if he is taken red-handed.

The Skunk kills fish. Only the salmon and other fish that are spent, and that are going to die anyway; they are better devoured than left stinking.

The Skunk kills bees. Not if the hives are properly placed on a shelf 3 or 4 feet from the ground.

"The Biological Survey has records of the contents of 62 Skunk stomachs examined by its field men. Of these stomachs, 37 were of Common Skunks, 9 of White-backed Skunks, and 16 of Little Spotted Skunks. As the food of these differs but slightly, they may be treated together.

"Grasshoppers and crickets formed a large percentage of the food of nearly half the Skunks examined. Beetles and their larvæ formed the most important item of food, being found in nearly two thirds of the stomachs, and in many instances, being the sole diet. Fifteen animals had eaten injurious rodents, such as Mice, Rats, Ground-squirrels, and Pocket-gophers, while 3 had eaten carrion; 3 had taken lizards and salamanders; 3, crawfish; 2, fungi; 2, earthworms; and 6, berries or other fruit. In one stomach, the feathers of a bird were found, and in another, that of an animal trapped in a henhouse, parts of a domestic fowl. Two stomachs contained centipedes; 1, sawflies; 1, cicadas only; and another the pulpy stems of a succulent plant.

"The 62 stomachs were of animals captured in every month of the year. While the number for some months is very small, analysis of results proves that Skunks ordinarily eat food that is abundant and easily obtained. When insects are plentiful, these constitute the whole diet; when they are scarce, the food is of greater variety. Thus, Skunks taken from January to March had eaten small mammals, lizards, crawfish, earthworms, fungi, and a few beetles. The diet in April and May was mainly beetles, a small mammal being the only exception. In June, in every instance, there was an unmixed diet either of beetles, grasshoppers, or cicadas. Eight of 14 Skunks taken in July, had eaten insects exclusively. In August and September, grasshoppers formed the chief diet, but a few beetles also were found. For the last three months of the year the insect diet was varied with other animal food, while berries were prominent in a few cases."

Summary of Food Habits

Thus may we sum up the dietary value of the Skunk: About 1 per cent. of his food is game birds and their eggs, in taking which he commits a sin against the interests of man, who wants to kill them for himself; 1 per cent. is wild fruits and berries; 98 per cent. is noxious bugs, and destructive crawling creatures that are a plague on the precious produce of forest, field, and farm, including army worms, tobacco worms, white grubs, hop grubs, potato bugs, grasshoppers, etc.

Every Skunk is the guardian angel of a garden acre. To destroy tnat Skunk is to devastate that acre. One by one, the various States have learned the truth of this, and passed laws to protect this righteous little citizen. New York led in 1893. Since then, nearly every State east of the Mississippi has removed the Skunk from its list of vermin and given him an honoured place among the creatures that are staunch protectors of the farmers and the farm; besides which, he is one of our largest national assets among fur-bearers.

The Strong Ones

If you refer to the title page of this volume, you will see pictured the two mighty ones, the invincibles, that few can face or conquer, the Porcupine and the Skunk. The unwritten law of the wilderness proclaims: "O-yez, oyez, stand, aside, give way, make room, the fearless ones approach! No creature who values life and joy can face these two! Make way! They come! The Porcupine and the Skunk."

But what happens when these two match their powers—when Greek meets Greek—when Agamemnon and Ulysses clash? It was the rare privilege of Enos A. Mills to see the meeting and tell us how it ended. He says:

"Dull fellows well met were Skunk and Porcupine. These dull-brained, but efficiently armed fellows are conceded the right-of-way by conventional wilderness folk. They blundered to head-on clash. Never before had this occurred. Each was surprised and wrathy. There was a gritting of teeth. Each pushed and became furious. Then the Skunk received several quills in the side, and in turn, the Porcupine a dash of Skunk spray. Both abandoned the trail, sadder but not wiser."[34] And I am terribly afraid that, one month later, the yellow and black burying-bugs were crawling through the ribs and jet black fur of the Skunk, who knew not how to be afraid.

Mills gives us also some delightful glimpses of the solemn reverence with which the Skunk is greeted in the animal world: "A Skunk passed by

[34] Watched, p. 120.

me, going down the trail. In sight was a Blackbear coming up. Which of these wilderness fellows would give or be forced to give the right-of-way? There must be trail rights. I sat near the trail, an innocent and concealed bystander—a bump on a log—wondering about the wilderness etiquette for the occasion.

"The Blackbear is happy-go-lucky. This one was preoccupied until within two lengths of the Skunk. A three-length side-leap, and he stood watchful and ready to escape. The solemn, slow-moving Skunk held the right-of-way and passed by without a turn of his head toward the curious and watching Blackbear. The Skunk ever has his own way. His influence is most far-reaching."[35]

This must have been an experienced, time-worn Bear, one up in the zoology of his region. But that same distinguished naturalist adds: "I came upon a Blackbear, who had guessed wrong, just a few minutes after he had charged a pair of young Skunks. His tracks showed that he had paused to look at them and do a little thinking before he charged. He had advanced, stopped, stood behind a rock pile, and debated the matter. The Skunks were young—but just how young? Perhaps he had tasted delicious young Skunk, and possibly he had not yet taken a Skunk seriously. When I came up, he was rubbing his face against a log, and had already taken a dive in the brook.

"A Fox came into the scene where I was watching an entire Skunk family. In his extravagantly rich robe, he was handsome, as he stood in the shadow close to a young Skunk. Without seeing the mother, he leaped to seize the youngster. But he swerved in the air as he met the old Skunk's acid test. Regardless of his thousand-dollar fur, he rolled, thrashed, and tumbled about in the bushes and in the mud flat by a brook."[36]

Of all the creatures claiming right of way in the West by reason of their bigness, the Grizzly, doubtless, stands first. When Lewis and Clark crossed the continent in 1804–06, they found on occasion that they had to concede the right of way to those monarchs of the Peaks, the Grizzly-bears. But, according to Enos A. Mills, even the Grizzly will step gravely aside from the trail to let the Skunk go by.[37]

Thus it is clear that the Smell-cat is accustomed to deference. But I knew of a Skunk that made a sad mistake when, on finding a nest of new-born kittens out in a fence corner, he sat down to make a comfortable meal of them. Their loud mewing brought the old Cat at racing speed. Raging

[35] Watched, p. 113.

[36] As above, p. 33.

[37] As above, pp. 114–15.

and fearless, she flew at that Skunk. What can face a mother Cat? What will not a mother Cat face for her young? The Skunk fought with all his weapons, muzzle-loader and breech-loader, long arms and short arms, but was badly defeated and escaped, not to be wiser—Skunks do not seem to learn discretion—but probably to die. How well I remember that old Cat, smelling to heaven, and blinking her bloodshot eyes so hard, as she silently endured the torment and stench. We had a profound reverence for her heroism, but we could not endure her person, and, for many weeks afterward, she was energetically invited to tarry in the wilderness.

Civil War

Many times, in my small zoo, I have seen fights between two male Skunks. They utter a low snarl as they draw near, the most scared one snarling the loudest. They approach, shoulder to shoulder, or even stern to stern, stamping their feet, and looking, not at each other, but over and past each other. As they close in, each tries to receive the other's first chop on the shoulder, and quickly counter and get his enemy by the throat. If they are evenly matched, they counter, parry, and shoulder-hustle for a few rounds, then call it off for that day; but are more than likely to keep on at a later time, till one is overpowered and killed. This we naturally prevent by separating them. If one is hopelessly overmatched, he squeals very loud and long, snarling and stamping, charging at his adversary, who keeps circling around him, presenting only his rump or shoulder, until the moment comes to wheel and seize him by the throat. I have seen the vanquished killed in one round and partly eaten—all within five minutes from the opening of the battle.

When they fight among themselves, Skunks seem to observe an unwritten law to abstain from using the musk. Evidently it would be wasted in such a combat. It would be like two ducks splashing each other. A Skunk fight is, then, strictly one of tooth and claw. The following detailed case represents several that I have heard of:

About the end of February, 1903, at Welch, Minn., Lee R. Gridley, of Appleton, Wis., was out with another trapper. They were following a Skunk track, and presently came on the animal fighting desperately with another of its kind. The Skunks struggled for a minute or two in silence, and *neither of them used his musk.* The trappers came up and killed one of the combatants; it was a male. The other escaped—doubtless it also was a male—but was so injured that it never came out of the hole into which it had crawled at the approach of the men.

The Story of "Broken-Bars"

To correct an erroneous impression, very widely spread in America, let me tell the story of how "Broken-Bars" was added to my zoo, which means my Skunk farm.

One day in the January of 1913, I walked past a certain ravine on the land adjoining De Winton Park. I smelled a strong odour of Skunk. The next day I had the same experience. On the third day, I took that same walk with the owner of the adjoining land, and at the same place again, our nostrils were assailed with Skunk musk.

"Now," I said, "I am going to follow up wind and learn why that has been here for three days."

My neighbour followed with a small spaniel Dog.

Before long, I saw, far ahead in the snow, a Skunk, and exclaimed, "There he is." My neighbour was at once alarmed for the spaniel, caught him, and held him in spite of his protests.

I walked toward the Skunk. It did not move away but stood facing me. This was surprising. But soon the reason was clear. It was held in a steel trap; and then I realized that it had been there in torment for three days.

My neighbour, clutching the Dog, shrank back in something like terror. But I said: "Have no fear. I know these creatures well." I walked gently up to the suffering and angry Skunk, talking very softly.

"Now, Skunky, don't be foolish. I am a friend of yours. I am ready to help you out of that awful trap."

As I came within 10 feet, the Skunk's tail flew up straight, and fluffed out to the full—a certain sign of manning the guns for action.

I held perfectly still, but kept on talking softly. "Now, Skunky, don't be foolish; put down that tail, and I'll help you."

Slowly the tail went down, and I gently approached and stopped. Several times, the tail flew up, and trouble seemed to be headed my way. But each time I held still and talked gently, till the tail went down.

At last, I was kneeling within 2 feet of the poor tortured creature. Its eyes were wild with suffering and fear. Yes, and with appeal. "Poor thing! You poor thing!" I exclaimed as I reached slowly forward, and took that horrible steel trap in my hands. It was clamped on the Skunk's hind foot. It had crushed the foot, and the whole limb was encased in bloody ice, so that I could not release it.

My neighbour was terror-stricken at my audacity. But I talked softly, and moved gently and slowly. I took my knife and chopped off the ice and

frozen blood. But my strongest efforts could not open the trap. So I gently withdrew, went to the nearest farm house and borrowed a nail keg. With this, I made the same slow, gentle, whisperful approach, put the keg over the Skunk, but left the trap outside. Now with all my strength on the spring of that cursed trap, it opened. The Skunk was free; I quickly turned it into the nail keg, and so carried it home. The broken foot had to be removed. But the Skunk recovered, to live happily for long afterward, and be known by the name that her broken white stripes suggested, "Broken-Bars," the gentle little Skunk mother that I rescued from the trap.

His Enemy—The Winged Tiger

The Hare is the most harmless of creatures. None fear it; it kills none; therefore all kill it. It has no friends. The fear of the Skunk is on all flesh; therefore, none kill it. It has no foes, excepting always man, and one or two of the cut-throats and desperadoes of the animal world.

When facing death by starvation, the Fox is said to consider the Skunk the lesser of the two evils. Doubtless, this is a question to be carefully pondered.

But there is another, a more dreadful enemy, the one of all those native to his woods, of which he should be most afraid—the horned owl.

The heedless, harmless Skunk is forth for his midnight meal-hunt. The hoot of the winged Tiger means much to the understanding grouse, but nothing to him. Is he not the privileged one, to walk alone, immune and unafraid? Forth he goes, as aforetime, nosing in this or that thick grass across the open field. Down comes the owl, silent, relentless, inevadable; he drops on the absolutely unwarned Skunk, his one fell clutch is fastened on the neck, the other on the waist of the victim. In vain, the strongest Skunk may squirm. His guns are spiked, his weapons gone—breech-loader and muzzle-loader, musk and teeth—both are rendered useless, neither can help him in that awful clutch. The Death Bird tears him open, spills his red life through his squirming loins, then feasts on the quivering flesh.

Of course, there may be times when the Skunk is warned, and, getting his battery to work, defeats the attack. Many an owl has been taken, smelling rank of Skunk; which does not by any means prove that he has dined off Skunk. On such evidence, I and many of my friends might be proven mephitivorous carnivores. But there is only too much reason to believe that habitually the winged Tiger makes the furry Smell-cat his prey.

Many a sportsman has, as in duty bound, brought down a great horned owl, to find him stuffed with black furred meat, and stinking of a musk that plainly tells us what that meat was when it walked abroad on earth.

So far as I know, but one naturalist has had the luck to see that tragic scene, and to record the finish fight between owl and Skunk. That was G. Norman Wilkinson, of Freehold, N. J. He says: "One morning, late in the autumn, I was driving through the woods, when I heard a disturbance in the dry leaves at a little distance from the road. I stopped my Horse and, as I looked in the direction of the sound, saw something struggling on the ground. As I drew near, I saw clearly the cause of the disturbance. A few feet in front of me was a large horned owl in a sort of sitting posture. His back and head were against an old log. His feet were thrust forward, and firmly grasped a full-grown Skunk. One foot had hold of the Skunk's neck, and the other clutched it tightly by the middle of the back. The animal seemed to be nearly dead, but still had strength enough to leap occasionally into the air, in its endeavours to shake off its captor. During the struggle, the owl's eyes would fairly blaze, and he would snap his beak with a noise like the clapping of your hands.

"Neither the bird nor his victim paid the slightest attention to me, though I stood quite close. How long since the owl had secured the death grip, I do not know, but there was no doubt about his having it. The Skunk could no more free itself from the owl's claws than it could have done from the jaws of a steel trap. Its struggles grew less and less frequent, and at the end of about 15 minutes, they ceased altogether. Then the owl loosed one foot, settled himself in a more comfortable-looking position, and appeared ready to enjoy the spoils of his battle. This I did not permit him to do."[38]

The Mad Skunk

Throughout the cow country of the Southwest, there is a widespread belief in the mad Skunk; that is, that every Skunk is more or less rabid, and goes about seeking whom he may bite and inoculate; with an especial fondness for sleeping campers.

The subject was investigated by the Rev. Horace C. Hovey, M.A., and the results published in the *American Journal of Science & Art*, May, 1874, pp. 477–83. He cites a number of cases (40) of men dying rabid after being bitten by the Skunk, and apparently accepts the popular view that all Skunks are prone to give this terrible disease, which he calls *Rabies mephitica.*

A year later, Dr. John G. Janeway, Asst. Surgeon, U.S.A., replied to this article.[39] After examining a number of cases, he maintained, first,

[38] *Birdlore*, Dec., 1913, p. 369.

[39] See N. Y. Medical Record, Mar. 13, 1875, pp. 177–80.

that the malady was ordinary hydrophobia; second, that it "is evidently epidemic, no cases of it having been reported previous to 1870 in this region."[40]

In other words, some rabid animal—Dog, Coyote, or Wolf—had appeared in the region, and bitten all that came his way. The Skunks, being slow and not accustomed to cede the right-of-way, were more often bitten, and, therefore, more affected as a species, with the dreaded malady.

The mere fact of a Skunk coming into your camp and biting someone, is presumptive evidence that it is mad. And the wisest course of the victim is to seek, not a madstone, but the doctor, who will, without doubt, give the best temporary treatment available and send you to the nearest Pasteur Institute.

The following from the editor of *Forest & Stream*, in the issue of May 28, 1910, p. 852, shows something of the virulence and prevalence of the dread disease: "For some years, Dr. C. E. Yount, of Prescott, Ariz., has been investigating rabies with special relation to the danger from Skunk bite. He read a report on this subject to the Arizona Medical Association last March, and he gave a list of 18 cases of Skunk bite in Arizona, of which 5 developed rabies, and died. Doctor Yount concludes that in Arizona the Skunk is the most prolific source of infection; in fact, almost the only cause of rabies. For the two years in question, 1907–09, rabies seemed to be peculiarly endemic in Arizona. The records of the Chicago Pasteur Institute for the past 18 years show that New Mexico has sent to that institution only 4 cases for treatment as against 33 from Arizona.

"Doctor Yount gives accounts of 2 cases which he examined, the little girl and the old trapper, of which notes were printed in *Forest & Stream* in 1908. In each of these cases, the incubation of the disease was 41 days. Doctor Yount concludes that the Skunk is the most prolific endemic source of the propagation of rabies in Arizona. In the last two years, there was one bite of rabid Coyote and one of a rabid Dog, the Dog having been bitten by a Skunk.

"Epidemic rabies would spread more rapidly in Arizona than elsewhere, if distributed by the more common carriers, the Dog and the Cat. There is no such thing yet known as a hydrophobia Skunk, but all Skunks are very susceptible to rabies."

In the northern and eastern States, a totally different condition prevails. First, I never heard of an outbreak of rabies among the Skunks here. Second, many men have been bitten by Skunks without experiencing anything but the temporary inconvenience of the cut. That is, the bite of an

[40] These two letters are quoted at length in Coues's Fur-bearing Animals, pp. 224–35.

ordinary Skunk is no more dangerous than that of any other creature with flesh-cutting teeth, if anything, less, because such a very small portion of its food is bloody meat.

Doctor Merriam says: "Twelve or fifteen years ago, when hunting and trapping Skunks, I was twice bitten by adult animals, and never suffered therefrom more than from equally severe bites from any other of our common mammals. About the same time, Dr. C. L. Bagg was also bitten, but, nevertheless, he still lives, and is practising medicine in New York City. Last summer I was again bitten by a Skunk—this time by a half-grown one that I had alive for several months—and have as yet experienced no evil consequences from the bite. Our Dogs have many times been bitten, and were never seriously injured thereby.

"While these pages have been passing through the press, I have again been bitten by a half-grown Skunk. The bite was inflicted upon the end of my left thumb, and healed kindly in the course of 3 or 4 days, leaving no scar."[41]

In handling my hundred-odd Skunks, I have many times been bitten, sometimes very badly, cut to the bone; but each time, I merely washed the wound with dilute iodine and have had no further trouble.

Irving M. June, the Skunk specialist of Stamford, Conn., has been bitten scores, maybe hundreds of times—a dozen times when I was present—and has never had any worse consequences than a sore finger for a couple of days.

Other Diseases

It gave me an awful shock when first I learned that animals had diseases, just as man had. Brought up in a school which proclaimed disease to be the direct consequence of sin, I was bound to believe that, animals being without sin, had no sorrows. Alas, would it were so! How easy would be the path of a fur-farmer, had he to give no thought to disease among his stock.

On the fur ranch, one becomes early and painfully impressed with the proneness of one's charges to disease.

In general, the keeper should watch the animal's dung; if too fluid, too hard, too copious, or too little, there is something wrong. *The appetite and the dung are the great tests;* where these are right, there is little chance of anything being wrong.

Of the 87 Skunks that I handled during my first three years of experi-

[41]Mamm. Adir., p. 87.

ment, I lost only 20 through disease. The ailments were pneumonia, tuberculosis, piles and protruding rectum, distemper, mange, worms, and cannibalism.

Lest any should think that disease is the result of association with sinful man, I quote first from Gerrit S. Miller, Jr., who collected and studied wild Skunks about North Bay, Ont.: "The adult Skunks taken at North Bay are all infected by the parasite that disfigures the frontal regions of the skulls of a large proportion of specimens of North American Mustelidae. I submitted one of the North Bay skulls with the parasites preserved in formalin *in situ* to Dr. W. McM. Woodworth, who identified the worms as *Filaroides mustelarum*, a viviparous nematode hitherto recorded from Europe only, where it has been found in various species of Putorius and Mustela."[42]

Col. Merwyn L. Chute, the English fur-farmer, writes me, after handling these animals for 10 years: "Skunks are remarkably hardy and free from disease, but they have one very harmful affection—that is, a particular worm called *Ascaris columnaris*. I have never received stock from the American continent which was not infested with this parasite. It is particularly hard to deal with, as there is no intermediate host in the life history of this worm. While it is not observable that Skunk die from worms, it has now been definitely established that the so-called pneumonia, from which losses have so frequently occurred, is due to the presence of the minute *Ascaris columnaris* in the lungs. The eggs are laid in the intestines, and after hatching, pass along the blood stream into the lungs, where the worms develop. Experiments have shown that Mice which have been given food containing *Ascaris columnaris* eggs, die of pneumonia within one week. This one pest would appear to be the sole 'disease' of Skunk in this country, and it can be eradicated."

When He Calls on You

If a Skunk comes into your barn, hen-coop or house, and you wish him to leave and take his smell with him, don't throw rocks at him, don't shoot him, don't approach him with violent language and movements, and, above all, keep your Dog away. If he is where you can see him, set as near as possible to him a small box with a 6-inch hole in one end. Gently manœuvre him toward this box. He is ever ready to pop into a dark hole when there is trouble in the air. Once he is in, put a board on the hole and carry box and Skunk away at your safe, good pleasure.

[42]Mamm. Ont., Proc. Bost. Soc. Nat. Hist., April, 1897, p. 42. See also Amer. Nat., March, 1897, Vol. 31, pp. 234–35.

If a Skunk come into camp or into my tent, as has occasionally happened, I let him alone, or feed him gently by dropping scraps on the floor, especially if I am perched up safely in a cot or a bunk. He feeds and goes pleasantly about his business, without hard feelings on either side. If not, I tell him to get out, making no violent movement myself.

But never would I shoot at, or in any way offer violence to, the visitor; that would surely be inviting disaster.

During my Northern Journey in 1907, I had in my boat crew some Indians, upon whose hunting grounds, far to the southward, Skunks were quite common. One of these men remarked with simple convincingness, "We have heap Skunks. He come in tepee much in night, we keep quiet, let him alone. He fill him belly and go peaceful, go good. No trouble. We think it better that way."

At all times, be careful to stand stone still if he hoist his fighting flag. Talk softly to him, but don't move till the flag goes down, as it presently will.

These things remember—refer to my Skunk experience in the Northern part of the creature's range.

In the cow country of the Southwest, there is another, though a remote, possibility to be reckoned with. That is, of the visitor being a mad Skunk. In this case, the cowboys, especially if sleeping on the ground, simply roll up in their blankets, muffle their faces, and wait for the trouble to pass. Once the fearsome visitor is out of the camp, it is customary to end the peril with a revolver shot.

But this is a subject discussed more fully on pages 345–347.

The Den

If the Skunk dig its own habitation, it usually selects a dry place on some hillside, but sometimes uses the burrow of a Badger or a Muskrat, or it enlarges the den of a Ground-squirrel to proper dimensions. Kennicott says: "Those who have opened its burrows on the prairie, say that it digs a hole 5 to 10 feet in extent, and a foot or two below the surface; at the end, a large chamber is excavated, and in this, a nest of soft grass is placed. The burrows which I have observed, were always on high ground, and usually in sandy soil; they were never at the edges of watercourses and ponds, like those of the Mink. In rocky regions, its residence will be found in the crevices of the rocks. . . . I have occasionally known it to take refuge in fallen hollow trees."[43]

It is also very ready to use a place under an outhouse or farm building;

[43] Quads. Ill., 1858, p. 248.

indeed, any kind of a hole will appeal to the Skunk, provided it be large enough, dry enough, and near enough to food.

I have seen a number of these holes. They are of about 8-inch calibre, go down at an easy slope for 6 to 10 feet, then rise for about 2 feet to a level some 6 inches higher, where is found the den. This is usually a foot wide, and is softly lined with grass and leaves.

A. S. Barton writes me that the Skunk abounds in the flat, marshy country about Boissevain, Man., and that the unusual conditions there have resulted in a new kind of Skunk architecture. "I found," he says, "a number of Skunk dens on the open meadows one year. They were made like the houses of Muskrats, but much smaller, on dry land, and of fine grass. I thought them the work of some abnormal Muskrat till I poked a stick in one and provoked the occupant to fire off his unmistakable scent."

Similar testimony is offered by E. L. Brown. In the November of 1897, while hunting and trapping in the marshy country that is found so extensively in North Minnesota on the Pembina trail, he and his friend "killed Skunks for several days. In all, we found 12 dens and killed 22 of the inmates. Most of the holes were shallow, in marshy places; such spots evidently being preferred in winter to the sand ridges, their summer resorts.

"These shallow holes were generally covered with dry grass, but the deep holes had no covering, though there was always a big nest of grass inside."[44]

The Skunks on my fur farm are the most enthusiastic nest-builders. No matter how much soft grass or long hay is left in the yard, the mother will chew it fine, and work on it till they have it all jammed into the den.

Finally, each gathers a bundle of hay under her body, rolling it with all four feet to the den mouth. Then, taking a good hold with her teeth, she backs in, pulling the bundle in so as to plug the hole against draughts.

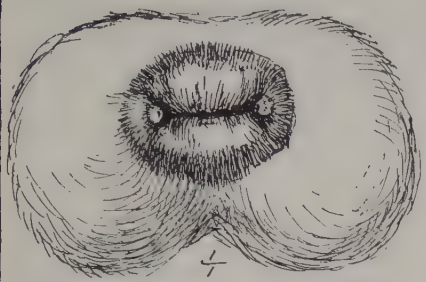
Mating Time

There can be no doubt that the females, at least, let off little explosions of musk during the winter, that is, the mating season, when denned up, without the possibility of provocation from an ordinary enemy. This may be, as Dr. Coues suggested,[45] a means of notifying their kind that here are some unmated females.

In Connecticut, the mating time is mid or late February. I have, however, known it to happen any time between Feb. 1st and Mar. 31st. Old

[44] Recreation, May, 1898, p. 363.

[45] Fur-bearing, p. 214.



Anus of Skunk ♂, the 2 nipples slightly everted for use.

1 Jan. 1913.

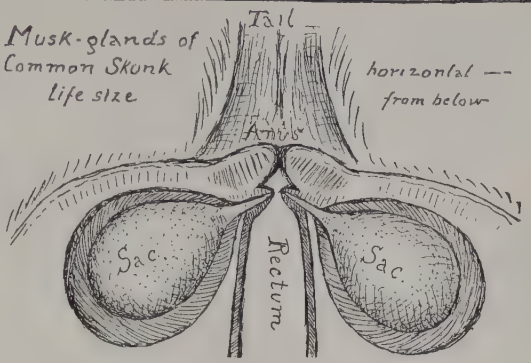


Plate LX. Details of Skunk (Common)

females in Connecticut usually are ready for the male about Feb. 18th. If, on this first heat, they are not mated, a second period occurs some four weeks later. The young females, that is, the young of last year, probably do not come in heat until mid-March.

Miles Spencer, of Fort George, Hudson Bay, thinks that the Skunk mates in October,[46] but I find no other supporter of this view. However, before we dismiss the idea as baseless, let us remember that in animals which assume a complete winter lethargy, the period of torpor is dead time. It does not count in the span of life. Emphasis of this fact might impose autumn mating, for, of course, about Hudson Bay, the intense winter makes the torpor more profound than in a warmer region.

The males indulge in fierce combats at these times—tooth-and-claw combats—for, as already noted, by a gentleman's agreement among themselves, they do not use their musk when they fight their duels. The record of such a fight has been given in the section on "Civil War."

Those battles that I have seen were in my Skunk yard. The rivals back toward each other, shouldering and pushing hard, till a chance comes to swing and seize by the throat.

In a wild state, the Skunk is frequently found to be monogamous, though probably often polygamous. But on the fur ranch, it is customary to give 3 or 4 females to one male. Some ranchers say that one male will serve a dozen females. Such an arrangement may work successfully at times, but would often result in a lot of barren females.

Female Skunks (females of most species indeed) have minds of their own when it comes to selecting a mate. The rancher who puts one male in a cage with 3 females during the mating season, and then assumes that all are impregnated, is surely falling into error. Two out of the three may accept him, and the third utterly reject and repel his approaches. Therefore, it is found well to change the male from pen to pen during the season.

As the coupling will take place in the den, and nearly always at night, observation is not easy. And this rearrangement of the families makes it very difficult to keep track of the young ones' pedigrees.

About the first of April, the wild female notifies her spouse in some way that he is no longer needed around the house; and in her judgment, it is an excellent time for him to try a change of life and air.

Forth he goes, and she is left in the den, under the spell of other and growing responsibilities. She cleans out the nest, relines it, devotes each night to the search for nourishing food. As a partial exception to this rule, I note that, according to my Journal for 1911, on Apr. 19th, at a certain

[46] Low, Expl. James Bay, 1888, App. III, p. 77 J.

Skunk den in my cow pasture, Cos Cob, Greenwich, Conn., I caught a beautiful starblack, pregnant female, and at the same hole on Apr. 21st, I caught a fine big starblack male, who was probably the father of the 7 young she bore; that is, if similarity of pattern and of abode prove anything.

Gestation and Borning

The period of gestation is nearly always 63 days—9 full weeks. In the Experimental Fur Farm, carried on at Saratoga Springs, N. Y., by the Department of Agriculture, they have found various extensions of the period up as high as 72 days. This, however, is very unusual.

Therefore, the brood begotten in mid-February is due to arrive (as do many of them) in the last week of April. Those begotten in the end of February appear in mid-May, as do most of them. But broods arriving in early June are not uncommon.

They vary in number from 2 to 16. My only proof that they may number 2 is as follows: "*May 19, 1919.* This morning, one of my young Skunks died. In her, I found only 2 young, the lowest yet recorded. They were within one week of birth."

A young mother usually produces 4 at her first brood, at her second, 6 to 8. The most I have ever seen in a litter was 10. One of my Western correspondents writes me that he has known an old female, caught after very fully grown, to produce 16 at a birth. This correspondent claims to have had 2 large litters from one female in one season.

When born, they are about the size of a Mouse, as in the illustration, are naked, and yet show plainly, in two shades, the pattern of the livery they are destined to wear—the bluish gray representing the black; the pale pink, the white. Indeed, it is easier to follow the plan of markings now than at any other time. In one or two cases, I have seen the young born with a fine coat of down. In one litter of 4, 2 were clothed at birth with fine down, and 2 were absolutely naked.

Eyes and ears alike are closed for some days after they enter this world of sights and sounds.

In captivity, there is a great danger of the mother devouring her young when first they arrive.

In a state of nature, there is no reason to believe that the young run any such risk. Whatever the impulse—fear, nervousness, fever, or thirst —Dame Nature has anticipated this stress and provided a remedy. From which we may argue that we should, as far as possible, repeat natural conditions in the zoo if we are to avoid this disaster.

Once the critical period is past and the mother love fully aroused by her squirming, helpless brood, her devotion is ideal.

Few enemies, indeed, there be that are willing to enter the den when she is on guard. Not much of hazard is in the young ones' lives just now. And yet it must be confessed with shame and sorrow that, prominent among their menaces, is their own father.

Observation in a state of nature is difficult, nearly impossible. But observation in the big pen of a fur ranch shows that some fathers—not all—are only too ready to make a stupid, criminal meal of the callow young, if they find them unguarded in the den.

Some of my trapper friends say that when the snow is still in the woods of New England, they have followed the trail of some old male Skunk, who went from den to den looking for young ones, then already born. And the traces showed that in some cases he had found and extirpated a brood—perhaps his own.

But this, I find, was generally agreed: that such wicked old reprobates are rare—the criminals of the race. Obviously, it must be so, or the whole Skunk race would perish.

In nursing the young, the mother sprawls over them like a setting hen. The kittens lie on their backs with mouths straight up, each attached to a teat, and so are fed in comfort.

Growth of the Young

Their development will be illustrated in the history of a brood born in my menagerie.

May 8, 1912 One of my best yearling Skunks, Beauty II, produced 4 young. Two of them were perfectly naked, and two covered with fine hair, which made them seem much darker than the others. These were not weighed at this time, but another brood of 6, just before birth, weighed 3 ounces, that is, half ounce each.

May 21. The young Skunks are now 13 days old. One of them weighs $4\frac{1}{2}$ ounces. All are now fully haired.

May 25. The young Skunks are now 17 days old. To-day their eyes opened—that is, nearly all. Some have but one eye open. This is the usual time, but I have known them blind till the 19th or 20th day.

Their fur is now well developed, but short and velvety. This is the time selected by most ranchers to disarm the kits. At this stage, it is a trifling operation, and apparently inflicts no pain, certainly it causes no loss of blood or appetite.

June 6. Beauty's young are now big and active. All are like herself in

colour—pure *hudsonica*—that is, long striped, with black tail-tip. Beauty's two sisters, Lina and Jane, both *hudsonica*, mated with a Connecticut *nigra*, have produced young of strictly *nigra* type. They do not come out of the den yet, but readily take their traditional attitude of self-defense when approached. They stamp and thrust out the two nipples of their musk bags. Yes, and have a distinct smell of musk.

June 7. Weighed 2 of Beauty's young. A male was 12 ounces, and a female 11½.

June 10. One of Beauty's young was out and walking around for the first time. It was very shaky; is now 32 days old.

June 11. Already Beauty's young show a temper, although the mother is gentle. Two of these, though they can scarcely walk, stamp and scold, trying to bite, and even to musk, when I go near. They are developing very fast now. At this time, the musk glands are the size of a pea, and begin to be functional.

June 13. To-day, Beauty's young took their first walk abroad, scolding and stamping at everyone and everything, even the feed pan. They are now 36 days old.

June 15. Beauty's young now run out and eat solid food. They are very coarse-haired and very unfriendly—very scrappy indeed, threatening and stamping much more than the elders when approached.

June 26. Beauty's young are now big, and running about like full-grown Skunks, eating the mother's food, etc. They are a quarrelsome lot.

The males weigh 1 pound 8½ ounces each; the females 1 pound 5 ounces each. This is their 49th day.

Their individual character begins to show, and it is possible, even at this early stage, to pick out those that will become tame and lovable.

In a wild state, the young stick close to the den all spring. This continues to be their home as long as they live on mother's milk. They never go far from the door till midsummer, when they begin to eat solid food, and also to venture forth at night under mother's care.

A lovely sight it is, an idyl of the underbrush, when, in their slick new coats of jet and snow, they go frolicking along like a litter of little Pigs, or like a family of kittens, with mother ever heedful, ever fearful, and quick to guard them; ready to seize one by the scruff of the neck and jerk him back with disciplinary force when he shows an over-eagerness that may mean peril. But though rough at times, she is ever valiant in their defense.

They are such a pretty, playful lot, and she such a loving and assiduous guardian, that the group realizes the ideal of family life, excepting, perhaps,

in one particular—the father is not present. After many inquiries among hunters and naturalists, I am forced to believe that the mother alone is active in caring for the brood; at least, when they are very small.

M. L. Michael, of the Skunk farm once existing in Monroe Co., Pa., gives the following interesting illustration of the mother Skunk's devotion: "One night," says he, "I brought a female and her 7 babies, two or three weeks old, and enclosed them in a wooden box. In the morning they were gone. The mother had gnawed through a corner of her prison. Knowing that the young, unable to walk, had been carried by their mother, I called a Dog trained to trail them, which at once led off. I followed closely. A mile away, the mother was located in a burrow. My men dug, and there we found her with her 7 children. By noting her tracks across a freshly harrowed field, we discovered that she had made 4 trips, bearing necessarily 2 each trip, except once, when she took but 1."[47] Thus, she travelled 7 miles that night.

July 9. To-day, I separated Beauty and Jane from the young, as they are half grown and feeding well on solid food. They are now 2 months old, and weigh about 2 pounds each. I am in hopes that the mother may arrange for a second brood.

July 12. On the 10th, I took Lina away from her young. Since then, I have seen little of her. As she seemed pining, I put her back with the young to-day. She was willing at once to mother them, but the little rascals all fought her, stamping, musking, and biting. I had to take her out again.

In a wild state, they are weaned about August 1st.

August 9. Disarmed all the young Skunks to-day. Not an easy matter, as they have fully developed weapons.

August 17. One of the Winnipeg mother Skunks escaped by climbing the fence, leaving her 5 young. They are now more than half grown. As she did not linger near, it shows that by midsummer the family bond is broken.

Autumn Life

By October, the young might pass for adults, but careful comparison shows them to be a little smaller, and much lighter in weight than the old ones. That is, they weigh 2 to 3 pounds, whereas the old ones may be double that.

They continue with their parents all fall and all winter. During the coldest weather, they roll up together in their underground home, sometimes the one in which the litter was born, and become sleepy, if not actually torpid, till called forth by a spell of warmer days.

[47] Recreation, Nov., 1901, p. 362.

In detailing a Skunk hunt in northern Minnesota, E. L. Brown says: "Not more than one old male was found in any hole; and the males were usually alone. One den contained an old male, 2 females and 5 young, which were nearly as large as the old ones. Only one was found that showed fight. This was a male, and he growled and bit sticks savagely."[48]

In the region about Lake Athabaska, Bellalise, my Indian guide, killed 6 in one hole during the trapping season. "And as many as 20 have been captured at one time in a single den in winter."[49]

The actual breaking up of the family is in the springtime, and the immediate cause seems to be the re-arousing of the mating instinct, or, at least, the instinctive desire of the mother to be alone when the next brood arrives.

The young of the previous year are now fully grown, and able, not only to care for themselves, but also to breed, although the first heat of the young females usually comes to them in March, even late March, rather than in February, as with the older females.

Father Skunk

But the father does rejoin the group at some time, for I have several times seen a large male Skunk travelling with them in the fall, and am inclined to think that he returns to his family as soon as the mother gives him permission.

The immense male Skunk that I killed Oct. 21, 1883 (see section on Weight), was accompanied by 4 smaller ones, almost certainly his family.

Now the reunited party wander about their own range, not caring in the least whether or not they reach home at bedtime, which is dawn.

In most Skunk ranches, it is considered unwise to let the father associate with the young until they are practically grown up, and even then, with discreet limitations, consideration of different tempers, and a large pen.

Will W. Christman, the well-known naturalist of Delanson, N. Y., supplies some interesting light on the home life and troubles of the Skunk pair. I suspect that Christman's picture is a true reflex of natural conditions.

He and his boys had a female Skunk that they kept over one winter. In her second autumn, they got a young male they called Pete. These two were wintered together. The male was a year old, and the female two years old at the time of the trouble. Both were fully armed.

In the spring of the year, there was much squealing and fighting in

[48] Recreation, May, 1898, p. 363.

[49] Forest & Stream, June 12, 1879, p. 365.

their pen. Then it turned out that the female, being large, was violently driving the male away from the den. Now it was found that in the den, there was a litter of young ones. The mother so tyrannized over the male that he crouched as far off as he could get, beaten and completely cowed. Christman took pity on him and turned him loose in the woods.[50]

Several times, according to records, Skunk ranching has been tried on the wholesale plan. That is, on large enclosures of an acre or two, with numberless nesting boxes, but no segregation of males, females, and young, the assumption being that this was the natural arrangement. Every one of these efforts has proved a disastrous failure, the most obvious cause being that the old males devour the young as fast as they can find them. This may, indeed must, be an abnormal and morbid inclination. But it exists, and is part of the evidence which compels us to believe that, in a state of nature, the female is alone with the kits as long, at least, as they are helpless in the nest.

Humoursome Skunks

Talleyrand is credited with having said, "All sweeping generalizations are wrong, including this one." In no place is this paradoxical aphorism truer than in the world of animal Lives. I hope the reader will not tire of hearing me reiterate the endless individual variations of my animal heroes. No two individuals, of the same species, even, are alike in mind or body. This is especially true of Skunks. Some 200 have I had in captivity, and of each and all, I could make a one-minute portrait of its pattern that would for ever after distinguish it from any other Skunk that I ever saw. And without question, their minds are as diverse as their bodies.

I have had loving, clinging Skunks, shy Skunks, impudent Skunks, sluggish Skunks, spitfire Skunks, sullen, dangerous, untamable Skunks, frolicksome Skunks, wise Skunks, fool Skunks, and, several times, Skunks with an amazing appreciation of fun.

Of this type was Jane. She was gifted with a large sense of humour. Jane had not been disarmed. It is well to leave some of them with "guns," in case of night marauders. My keeper was a Yankee who was much afraid of Skunks, having been shot once or twice in his boyhood. On many occasions when this keeper went into the big pen with the food bucket, Jane, though averse to the man, would go galloping to meet him, throw up her tail, and approach sidewise with unmistakable threats. The Yankee, knowing what was coming, usually dropped the bucket and ran. This was what Jane wanted. She now had first pick of its contents. Her whole expression

[50] Forest & Stream, Feb. 5, 1910, p. 212.

was one of Skunkish glee. Never once did I see symptoms of wrath in any part of the oft-repeated scene.

But the clown of the ranch was Johnny Jump-up. He had a droll and surprising way of standing on his fore feet with hind legs up in the air. It was usually done in a sort of playful threatening. He would stamp, run forward two or three paces, give an extra hard stamp, and throw his hind quarters straight up in the air, with tail hanging forward and down to one side. He always seemed to be in a rollicking good humour when he did it. And yet there can be little doubt that it was originally meant as a promise of attack.

When a Skunk threatens an enemy, he commonly stamps with his fore feet, runs a few steps forward, and swings his rear end up or around in a menacing fashion. This throws the tail forward and the hind feet off the ground. Usually it serves its purpose of frightening the enemy away. If not, the Skunk can always make good the threat of which this was the "bluff."

A little exaggeration of this movement results in the hind quarters going high up in the air. In the case of Johnny Jump-up, he had carried it so far that when his hind legs were up in the air, he could pause and hold the pose for several seconds. I tried several times to photograph him in the act, but failed. Out of a couple hundred Skunks, 3 did the trick, 2 females and Johnny Jump-up.

Doctor Merriam was fortunate to find a merrymaker among the numerous Skunks that he tamed and petted, and gives his history as follows: "Two summers ago, I was the happy master of the cleverest young Skunk that I have thus far chanced to meet. For a name, he received the title of his genus, and we called him 'Meph' for short. By way of precaution, I removed his scent sacs, and he made a rapid and complete recovery after a few days of temporary indisposition. While driving about the country in the performance of professional duties, he usually slept in my pocket. After supper, I commonly took a walk, and he always followed close at my heels. If I chanced to walk too fast for him, he would scold and stamp with his fore feet, and if I persisted in keeping too far ahead, would turn about, disgusted, and make off in an opposite direction; but if I stopped and called him, he would hurry along at a short ambling pace and soon overtake me.

"He was particularly fond of ladies, and I think it was the dress that attracted him; but, be this as it may, he would invariably leave me to follow any lady that chanced to come near."

The next paragraphs detailing the food habits of this interesting creature, will be found in the section on Food; after which the story continues:

"His nest was in a box near the foot of the stairs, and before he grew strong enough to climb out by himself, he would, whenever he heard me coming, stand on his hind legs, with his paws resting on the edge of the box, and beg to be carried upstairs. If I passed by without appearing to notice him, he invariably became much enraged, and chippered and scolded away at a great rate, stamping meanwhile most vehemently.

"He always liked to be carried up to my office, and as soon as strong enough, would climb up of his own accord. He was very sprightly and frolicksome, and used to hop about the floor and run from room to room in search of something to play with, and frequently amused himself by attempting to demolish my slippers. I have often given him a bit of old sponge with a string attached, in order to keep him out of mischief. During the evening, he occasionally assumed a cunning mood, and would steal softly up to my chair and, standing erect, would claw at my pants once or twice, and then scamper off as fast as his little legs could carry him, evidently anxious to have me give chase. If I refused to follow, he was soon back to try a new scheme to attract my attention."[51]

I have been the owner of many Skunks that were, in some measure, pets. I had one or two of most affectionate disposition, that would run to me and whine to be lifted up and fondled. Beauty, Mopsy, and Speckle-cap were of this kind, but I never had one that was quite as intelligent as the above. Nor did I ever have one that I could trust to follow me when I took a walk.

Five Years on a Skunk Farm[52]

How I Came to Begin

While following zoological studies myself, I was not forgetful of the boys who wanted the very thing that I had so hungered for as a child. I organized the Woodcraft Indians as a methodic approach to all the joys of wild life. This organization began in 1902; the boys trained in its ways were growing up. I was in some degree responsible for keeping alive in them a love of outdoor life and animals. When it came to choosing their life work, they wanted a calling that would gratify these wild instincts, and yet they did not hear the call of the farm. Farming does not pay here, we agreed. It cannot compete with the West.

"There is only one line specially adapted to New England," I told them. "That is fur-farming. It is bound to be a great national industry,

[51] Mamm. Adir., pp. 73–75.

[52] This first appeared in the Country Gentleman, for June 11, 1921.

for the wild supply of fur is going down and the demand is going up. There is no possibility of materially increasing the wild contribution. The only new source in sight is the fur-ranch."

So I set about founding a Skunk farm to teach myself, and then my boys, the principles of fur-ranching.

The Story of Black Beauty

Many singular and amusing characters were added to the stock, but the most interesting of them all was the little black female caught in my meadow. She had a white tip to her tail, a tiny white star on her forehead, and a full white cap on the back of her head; all else was a clear deep black. So we called her Black Beauty. She had the gentlest, sweetest disposition of any Skunk I ever knew. Almost from the first, she would eat out of my hand, and soon she won the hearts of all who made her acquaintance.

On April 19th, she was trapped and brought to the menagerie. I set the box on the table, and gently lifted the lid. She sat demurely hunched up in the far end, watching us with shy bright eyes. Then the keeper said, "See, there's a blue tick just over her eye."

He reached forward a sudden, well-meaning, ill-advised hand to pull the tick off, but it scared the shy Beauty, her back went down, her tail went up, and a flash of blinding spray was fired forward, hitting only the side of the box, as it happened, but showing how unwise are sudden movements when you are dealing with a wild Skunk. This was the only time that Black Beauty misbehaved.

I dipped a twig in gasoline; then, talking gently to the Skunk, so that she sat very still, I reached slowly forward and dropped one drop on the blue bug, which very soon rolled off dead.

Several tragedies had taught me already that the Skunks must either run at large in a big tight pen, or be kept each of them in a separate cage. Now I had a new lesson to learn. Any one who sees the Skunk during our Northern winter, would be surprised to learn that it is very susceptible to cold and easily catches pneumonia.

Black Beauty was about to become a mother. I gave her a box like a small kennel, and plenty of hay. She fixed up a nice nest, and seemed happy in the prospect. She made a plug of hay to pull into the door and close it when she went inside. But the cage was in a draughty place, and the nesting box door very wide open. She was gentle and happy, eating little, and very busy fixing up the nest, as the fateful day approached.

In the middle of May, she had a bad spell. Her bowels were out of

order, had not moved for two days; she refused food and evidently had a cold. (Oh, why didn't I see, and know why?)

I gave her a laxative—that is, chopped chicken and castor oil—and she soon seemed better. On the 18th, she was well and cheerful as before, eating with good appetite. On May 24th, she was brooding happily over 7 little pink babies, and all seemed well. Next day, everything seemed all right, though she did not come out. At noon of the 26th, she was lying with head and shoulders out of the nest door, and gasping for breath, very ill. At 1 o'clock, Black Beauty was dead.

Even now, as I tell of it, it gives me a throat grip. I recall that soft, gentle, beautiful creature, mothering her little ones to the last of her dying strength. And the sad thought is this: that I killed her in my ignorance. The pneumonia that took her found an easy conquest, thanks to the draughty cage and a sleeping den with a doorway open to the wind.

A remedy was soon devised for these defects, but never since, in all the hundreds of Skunks I have kept, have I found one that could fill the place of Black Beauty—the most lovable Skunk I ever knew.

Management of Breeding Mothers

That year, the other females all promised to have families. The time came and passed. The mothers resumed their normal lives, but never a young one of theirs did I see. Consultation with other ranchers made it clear at last. The young had been born, but abnormal conditions had perverted the maternal instincts, so that their own mothers had destroyed them.

Many experiments and much sacrifice it took to solve this, the great problem; and our present knowledge may be thus briefly presented:

In autumn, the full-grown Skunks are commonly 6 or 7 pounds in weight, which means they are very fat. During winter, they should be fed little or nothing, for by February, they must be thin, that is, down to 3 or 4 pounds each for the females; or they will not breed successfully.

About February 1st, each male should be in a pen with 3 or 4 females, and there should be a separate nesting box for each. If, after a few days, one or more of the females fights the male and keeps away from him, try her with some other male. For they are very positive in their likes and dislikes; they will not accept a male that does not please them.

By April 1st, it is safe to assume that all females are pregnant. Take the males away now, leaving the females free in the big yard. This is necessary, or they will not take sufficient exercise.

Feed the females all they will eat from now on, giving a variety of food —table scraps, sour milk, fruit, bread, etc., adding a spoonful of lactol to their daily ration, also a spoonful of dry powdered yeast. Once or twice a week, add a little limewater to their drink, and give raw meat at least once a week. Follow the methods of Dog men raising their thoroughbreds.

About April 30th, shut each female up in a separate pen, with a warm nesting box; give her plenty of soft hay, and she will amuse herself lining the nest and getting ready for the family. One of the difficulties at this time is to make them exercise enough.

As May comes on, the mother's time is near; she should have a raw chicken head twice a week. If she is at all fat, add half a spoonful of carbonate of soda to her food every other day. This will offset the possible acidity of the milk.

The young are born usually in mid-May, and now is the crucial time. If the mother is ill-nourished, the young pine away and die in a few days. If her hunger for fresh meat has not been met, she will eat her young. At this time, it is well to give her a chicken head or other fresh raw meat every day.

In a week, the crisis is past, and the young that still survive are likely to grow up successfully.

The Second and Third Seasons

But this knowledge did not come for several years. Meanwhile, the second breeding season, 1912, saw me with 7 breeding females. I mated them with selected males. Six of these produced young. I think the 7th one ate hers. Three of the mothers raised theirs, the broods being 4—6—6.

In 1913, I had 13 brood mothers, and 12, I think, had young, the broods being, as I saw them, 3—3—4—5—6—6—6—6—7—8—?—? There can be little doubt that the last two had broods and ate them. But I was surely solving the hardest of the problems.

At this period, my Skunk yard on summer evenings was an ideal scene, with beautiful, glossy-furred, ambling Skunks everywhere. If I sat down they would scramble up into my lap. If my little daughter came in, she was at once surrounded by many playful Skunks that climbed on her knee, or kissed her face in Dog fashion. At such times, the idea that I was raising these gentle things to kill for their skins, seemed something like a combination of murder, cannibalism, and sacrilege. Yet, that had been the original thought, and its realization was acknowledged to be the only true measure of success.

A New Source of Profit

Now all was going well, for I was surely raising droves of healthy little Skunks, and a new possibility loomed up. Never had I thought that Skunks themselves would pay; for a dollar apiece was the market price of the pelts. I expected only that Skunks would teach us the fundamentals of success in all fur-farming. And they were doing so.

But while I experimented, an unlooked-for change came over the prospect. Skunk fur had been steadily rising in value. $2 and $3 a skin was now paid for good ones, and that meant that Skunks might in themselves become a paying proposition. In addition to this, an overlooked but perfectly natural source of revenue appeared. A pair of black Skunks bred true black for generations, were worth perhaps $5 as pelts, but as breeders to sell alive to other ranchmen, they were worth $25 the pair.

Fourth Year

It now looked as though the Skunks in themselves would be safer for us to handle than more expensive animals, of which we knew little and had no stock. Therefore, I determined that 1914 should be the great Skunk year. I would plan for 100 breeding mothers, and expand next year, perhaps to 400, which I set as the limit of possibility for one man to handle. Four hundred breeding mothers would average 4 young each. Their young, supposing they were marketed only as pelts, would be worth about $5,000, to which the returns for those sold alive must be added. The first great expense, the skunk-proof fencing of an acre of land, had already been met. The additional equipment of boxes and cages could be made by the man in between times, especially as all winter there was little for him to do on the ranch.

All was set for a great demonstration and a great success. Then came the great shock from a great fact, as it has come to so many business prospects. We cannot print it too large—EVERYTHING TURNS ON THE MANAGER.

The New Manager

So far, I had been much away, and had to entrust the details to a head keeper, but, upon the whole, I had been manager, and had been much with my Skunks. They knew me and came to me; they were as tame as kittens. Their lives were without any great nervous shocks. I had tried to make them happy, for that is the secret of success with animals. Now I was to be away for long periods, and the man I secured to manage in my absence,

PLATE LVII.—FOOD-TIME ON THE SKUNK RANCH

These animals are not disarmed

By E. T. S.

PLATE LIX.—A SKUNK FAMILY

though he professed great interest, was not an "animal-man." He was honest and faithful in a way, but it was an awfully stupid way. He would throw in so much feed every evening, as instructed; but the idea of seeing how they liked it or whether last evening's supply was gone never occurred to him.

Once a week, he cleaned out the cages, but any evidence of disease would not make him change this routine. A Skunk might be dead in its box for a week; he would never notice it until the time came to clean out that box. The fact that its food supply had long been untouched had no message for him. The mere incident that certain foods were like poison to certain Skunks was uninteresting.

When, on my brief visits home, I would go the rounds and say, "What's the matter with that Skunk, her eyes are running?" or "Why does this one act dopey?" or "that one go lame?" or "Why are those two quarrelling?" he would answer, "I dunno—I never noticed." No, he never noticed them; he never petted any of them. The result was that they grew up wild and shy. The nervous excitement that gentling and taming allays possessed them all; once more the mothers began to eat their young. So that fall, a census showed only a total of 63 Skunks instead of twice that many.

The Fifth Season

In 1915, I was still more away, and the stock declined instead of increasing. Noting that the Skunks are very fond of milk, and it was easy to get, for it took no cooking, my brilliant keeper fed them a milk diet. The fact that it scoured them violently never reached his attention. When I came home, the long terrible purging had killed many, and others were plagued with protruding rectum.

Then another act of gross stupidity. Ignoring a change in weather, he exposed the whole stock, so that an epidemic of pneumonia carried off half of them. A local outbreak of distemper got among the young ones, but was totally ignored in my absence. I came home to learn of more fatalities, and the obvious cause spreading in the pens. It never occurred to the bright keeper to isolate the sick ones.

In 1916, I unfortunately kept the same mismanager, trying to teach him, for he had his virtues. But once more, in spite of fine stock and good equipment, we had no young ones at all. That is to say, every one of the 20 mothers destroyed her own brood.

The war conditions were upsetting everything. It was impossible to select a good keeper, and it was not possible for me to be at home to manage the ranch myself. Work for the Woodcraft League kept me busy at camps

and meetings far away, when I should have been taming and guarding my Skunks. Since I could not get a real "animal-man," I decided to give up the Skunks, and offered the lot, now reduced through sales, etc., to 17, to the U. S. War Department, with full instructions for running a Skunk ranch, all free as a gift toward the problem of finding callings for crippled soldiers. This offer never received any acknowledgment. Meanwhile, our friends in England heard of the possibility, sent over, and bought the whole outfit. The stock is now in England, carried on as a fur-ranch in the Cheviot Hills. The French authorities also took notice of the experiment and its practical results. The Société d'Acclimatation awarded me the first medal for mammalogical research given in America by France since the beginning of the War.

Looking Backward

Some fifteen years have flown since I began my Skunk ranch. The Great War has rolled its frightful Juggernaut across the world; everything is changed. Those long-past days among my Skunks begin to wear the rosy hue of youthful memories.

What bright, happy hours they were that I spent with the glossy, playful broods. I have no language to explain the little thrills of pleasure they begot. I used to tell myself that it was the sense of success in the raising of fur. Of course, I knew it was not; for the idea of killing one of the exquisite creatures for its fur was horrible. My pleasure was that of the naturalist, happy in seeing and in being among abundance of joyous animal life. I used to make excuses to go and sit among them. Not by day only, but at night, oftentimes after a dinner or theatre party or a late opera, if it were moonlight, I would slip away from the family, to linger in silent happiness among the merry, fur-clad throng. In a sort of wordless joy I would sit, as they gambolled about or climbed into my lap or pawed my foot in scratchy invitation to a romp. I would hold one up and gaze into his beady eyes, and try to reach and read his little soul. Those were good times indeed!

But they are gone and now I miss my Skunks, I long for their company again, just as a schoolboy longs in later years for the comrades he played with, liked and disliked, or even fought with—for they were his comrades, part of his play and his merry life gone by.

But those times are past, and all my Skunks are gone. I wonder where. Yes, I know they are dead. But where are those little minds? Sleek, jolly Tip, who would crouch on my lap for hours, as long as I stroked her; Lina, with her broods of many kits; Happy Hooligan, who bit my finger to

the bone; Merry Jane who shot the keeper; Johnny Jump-up, who could throw a handspring, and often walked on his front feet; Fat Blazer, who killed herself with over-eating; Black Beauty, gentle and trusting; Double-dot, Three-bars, Split-cap, and many others that would scramble to my arms and nose in my pockets for sweets, and love me with a little churring song. All gone, but where?

Where are you now? Were you mere little bubbles of the life force, to pause, touch mine in kindly sympathy, then vanish for ever? Or were you little personalities, travelling on your upward trail, and foreordained to meet with mine in generous understanding?

It is a dozen years ago, winsome Beauty, bright-eyed Tip; but I feel your gentle touch, the touch of kindness that does not die. You may be passing nothings in the flood, but this is my dream and hope—that we shall meet again. My instinct, wiser than my wit, says you were personalities that shall, that do endure.

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LIFE XXVIII—THE HOODED SKUNK

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A Pair of Hooded Skunks eating Crickets by Moonlight. E.T.S.

Hooded Skunk or Long-tailed Skunk

Mephitis macroura Lichtenstein

(*Macroura* Gr. from *macros*, great; *oura*, tail)

Mephitis macroura Lichtenstein, 1832, Darstellung Neuer oder Wenig Bekannter Säugthiere, pl. 46.

Type Locality—Mountains northwest of the City of Mexico.

The Hooded Skunk looks much like the rest of the family; that is, those of the genus *Mephitis;* but is usually easy to tell by its big blooming chrysanthemum of a hood and its excessively long tail. It is much slenderer in body than the others. It is indeed a long, slender weasel-like *Mephitis*, almost a *Spilogale*, while the Hog-nosed Skunk goes to the other extreme, and is a *Mephitis* endowed with the general make-up of a Badger.

The skull of the Hooded Skunk is so different in detail from that of true *Mephitis* that Howell puts it into a new and distinct subgenus which he calls *Leucomitra* or "White Cap."[1]

In addition to these subgeneric characters the Hooder has the following:

Size. Total length, about 24½ in. (623 mm.); tail, 11¾ in. (299 mm.); hind foot, 2¾ in. (67 mm.).

The ♀ is somewhat smaller: Total length, about 23½ in. (594 mm.); tail, 11¾ in. (299 mm.); hind foot 2⅜ in. (60.5 mm.).

Colour. While it wears the usual family livery of black and white—warning colours probably—the pattern of the Hooder is distinctive, and is thus described by Howell, whose monograph of the genus is taken as the basis of this Life.

"Two patterns occur [in the Hooded Skunk], one in which the upper parts are nearly all white; the other, in which the upper parts are nearly all black, with narrow lateral stripes, and under surface of tail, white. Between these two extremes are many intermediate phases. The frontal stripe is narrow and often absent.

"In the *white-backed* phase, a broad band of white begins between the ears and covers the whole back and upper surface of the tail, the long white hairs drooping gracefully from the sides and over the tip of the tail. This band is of varying width, but is never bifurcated as in true [*Mephitis*]. There

[1]N. A. F., No. 20, 1901, p. 40.

may or may not be a white lateral line separated from the dorsal band by a black area. The dorsal band is never of the deep creamy hue so frequent in the stripes of [*Mephitis*], but is composed of nearly pure white hairs with numerous black ones intermixed, and so is more or less distinctly grayish in effect. The lateral stripes, when present, are always without this mixture of black hairs.

"The *black-backed* phase usually has the narrow frontal stripe, and may have the white hood, which, however, is often absent. The white lateral stripe is almost always present, though varying in width from an inch or more to a mere trace; it is frequently replaced by two narrow stripes on each side. The lower surface of the tail is usually white, though sometimes the whole tail is black externally.

"As in the typical subgenus, the bases of the tail hairs in both phases are invariably white. Irregular white spots on the ventral surface of the body are frequent."[2]

Races

The following races have been recognized:

macroura Lichtenstein, the typical form. T. l., mountains northwest of the City of Mexico.

milleri Mearns, similar but larger, and with heavier skull. T. l., Fort Lowell, near Tucson, Ariz.

vittata Lichtenstein, smaller than *macroura*, and with very small skull. T. l., San Mateo del Mar, Oaxaca, Mex.

Range, Habits, Etc.

This is a Mexican species that has leaked a little way into Southern Arizona and New Mexico.

Its habits are much like those of the Common Skunk. As elsewhere noted, many of the Skunks and Weasels are subject to a parasite which develops in the nasal bones, and subjects them to much distortion and, probably, pain. Of the present species, Howell says: "A very large proportion of the skulls examined, had been infested with parasites, and the distortion of the cranium through this cause is greater than in any other species examined. One specimen in particular had the swelling produced fully 7 mm. ($\frac{5}{16}$ of an inch) above the normal top of the cranium, and spread to a width of 28 mm. ($1\frac{1}{8}$ inches), although the mastoid breadth of the same specimen is but 31 mm. ($1\frac{1}{4}$ inches)."[3]

Poor fellow! how he must have suffered, and no hospital at hand.

[2] N. A. F., No. 20, p. 40.

[3] N. A. F., No. 20, p. 43.

LIFE XXIX—HOG-NOSED SKUNK

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Hog-nosed Skunk, White-backed Skunk, White-tailed Skunk, Texan Skunk, Badger Skunk, Conepate

Conepatus mesoleucus (Lichtenstein)

(*Conepatus*, from the native Mexican name *Conepate* or *Conepatl; mesoleucos*, from Gr. *mesos*, the middle; and *leucos*, white, referring to its unbroken white mantle)

Mephitis mesoleuca Lichtenstein, 1827, Darstellung Neuer oder Wenig bekannter Säugthiere, pl. 44, fig. 2.
Conepatus mesoleucus Merriam, 1902, Proc. Biol. Soc. Wash., vol. 15, p. 163.

TYPE LOCALITY—Near Chico, Hidalgo, Mexico.

MEXICAN, *Zorilla.*

The genus *Conepatus* Gray, to which this animal belongs, is native to South and Central America; resembles *Mephitis* in general anatomy, but is thicker and heavier in form, with a short and much less bushy tail. The muzzle is naked for about an inch on top, and has the nostrils on the underside. Its dental formula is different from that of *Mephitis*, and is thus:

$$\text{Inc. } \frac{3-3}{3-3}; \text{ can. } \frac{1-1}{1-1}; \text{ prem. } \frac{2-2}{3-3}; \text{ mol. } \frac{1-1}{2-2} = 32;$$

that is, lacking 2 upper premolars.

The genus *Conepatus* seems to be generally distributed in South America, to the exclusion of all other Skunks. That is, its members appear to be a South American group of animals, which has extended its range northward through Central America, Mexico, and across the border of the United States, to central Texas, New Mexico, and Arizona. In Mexico, they range from sea level to above 10,000 feet altitude on the mountains of the interior.

In addition to these generic characters, the Hog-nosed Skunk has:

Size. Total length, about 24 in. (608 mm.); tail, 7 in. (177 mm.); hind foot, 2½ in. (63mm.).

Weight. 5 lbs.[1] The weight of Audubon's specimen was 5 lbs., but we are told that this is one of the largest of Skunks; therefore, no doubt, it sometimes reaches the weight of 7 to 10 lbs.

[1]Q. N. A., II, p. 19.

Colour. The body and legs, entirely black below the middle line of the flanks; the cap, back, and entire tail unbroken white. No face blaze.

The hair on these Skunks is coarse and harsh in summer; but in the cooler parts of their range, at least, their fur is comparable to that of their Northern relatives. Summer hair in the tropics is so inevitably a harbour for vermin that it is usually reduced to little or nothing.

Races

The following forms have been recognized:

mesoleucus Lichtenstein, the typical form. T. l., near Chico, Hidalgo, Mexico.

nelsoni Goldman, much like *mesoleucus*, but with narrower skull, etc. T. l., Armeria (near Manzanillo), Colima, Mexico.

mearnsi Merriam, similar to *mesoleucus*, but skull and molar teeth decidedly smaller. T. l., Mason, Mason Co., Tex.

venaticus Goldman, a small form much like *mearnsi*, but with narrower skull, etc. T. l., Casper Ranch, Blue River, 12 miles south of Blue, Greenlee Co., Ariz.

telmaletes Bailey, similar in general appearance to *mearnsi*, but skull usually slenderer; dentition lighter. T. l., Big Thicket, 7 miles northeast of Sour Lake, Hardin Co., Tex.

leuconotus Lichtenstein, a large form, with a white stripe beginning before the eyes, and continued on to the rump. T. l., Rio Alvarado, Vera Cruz, Mexico.

texensis Merriam, similar to *leuconotus*, but somewhat larger, with white dorsal area more restricted. T. l., Brownsville, Cameron Co., Tex.

filipensis Merriam, size, small; pelage, soft, full, and woolly; dorsal stripe narrow, especially on shoulders. T. l., Cerro San Felipe, Oaxaca, Mexico.

nicaraguae Allen, "differs from *filipensis* and *pediculus* in its much larger size, and especially in the larger size of the last molar." T. l., San Rafael del Norte, Nicaragua.

pediculus Merriam, smallest of the known kinds; hind foot, 61 mm. T. l., Sierra Guadalupe, Coahuila, Mexico.

sonoriensis Merriam, size, large; hind foot, 85 mm.; white dorsal band broad throughout; skull, long and slender. T. l., Camoa, Rio Mayo, Sonora, Mexico.

Besides which, is the species *Conepatus tropicalis*, with two narrow white dorsal stripes. It extends from Mexico to Panama, at least; it is found in 2 races, and is referred to the separate subgenus *Marputius* Gray.

Range

The range of *mesoleucus* is sufficiently indicated on the map, but it is evidently working northward.

F. W. Miller says it is a regular resident of Baca Co., and probably north to Pueblo, Colo. About 1 or 2 out of 25 Skunks taken are of this species.

The latest and northmost record is from near Colorado Springs, Colo. If ever a medal is given for heroism in collecting scientific specimens, all who know the big Skunks will agree that Mr. Sam Keaton is amply entitled to wear the honour, for the way in which he secured a Hog-nose without injuring its skin, on December, 1920. The record is by Edward R. Warren, of Colorado Springs, and is as follows:

"This specimen was taken by Mr. Sam Keaton, near his ranch on Little Fountain Creek, some 12 miles southwesterly from Colorado Springs, at the edge of the foothills. Mr. Keaton has lived on this place from his boyhood, since 1873, and while he has trapped *Mephitis* and *Spilogale* there, he had never before seen a Skunk like this, and recognizing it as something new, was afraid to shoot it, for fear of injuring it too much, therefore threw stones at it, chased it, and finally threw himself down upon the animal and strangled it with his hands."[2]

The Hog-nosed Skunk is "found on the brown, broomy sedgy plains as well as in the woods, and the cultivated districts of Texas and Mexico."[3] Where the ranges of the Hog-nosed and the Common Skunk overlap, their home-surroundings are the same. Both frequent the bottom-lands of watercourses, where cover of various kinds is abundant, and the supply of food most plentiful, or cañons and mountain slopes among the rocks.

Den and Young

The Hog-nose digs its own den, usually in a bank, or under a rock or the roots of a tree, for it is well equipped for burrowing; but it does not hesitate to take possession of the deserted burrows of another animal, or of a natural cavity among the rocks, or even to use a hollow log. That is, it is precisely like the Common Skunk in this respect.

All the evidence at hand implies that the mating habits of *Conepatus*

[2] Journ. Mamm., May, 1921, p. 112.

[3] Q. N. A., II, pp. 19–20.

MAP VII.—RANGES OF HOG-NOSED SKUNK OR CONEPATUS, AND OF WOLVERINE
By E. T. Seton, with assistance of the Biological Survey

Range of Hog-nosed Skunk or Conepatus, chiefly in Mexico.
Range of Wolverine, omitting the new forms named by Matschie, chiefly in Canada.

are like those of the Common Skunk. Its young, however, seem to be fewer in number.

On March 24th, near Langtry, Texas, James H. Gaut collected an old female, "which contained a single embryo that he thought would have been born a week later."[4]

He also reports 2 females taken in April as nursing young, and with one of these he found 3 small young, about a week old, in a hollow stump.[5]

Food

The sweeping generalization that all animals are omnivorous, applies fairly well to nearly all our carnivores, outside of the Cats; but is especially true if we add a phrase that indicates the staple choice of that animal. Thus, a Badger is omnivorous, but its main food is Ground-squirrels. A Fox is omnivorous, but its main food is Mice. The Skunks are omnivorous, but their main food is insects.

The Hog-nose diet is even more largely made up of insects than is that of the others, and he has specialized on insects that hide in the ground; that is, beetles, grubs, and larvæ. For this, he has developed that surprising pig-like snout.

Says Nelson: "In addition to grasshoppers, crickets, beetles, flies, grubs, and other larvæ, and many other insects, they are known to eat Wood-rats, Mice, and the small fruit of cactuses and other plants. The stomach of one of these Skunks examined in Texas contained about 400 beetles."[6]

Of course, there are freaks and perverts in the best of families, and "one Texas naturalist writes that he has lost a number of young kids which had their noses bitten off; and, in one instance, caught one of these Skunks mutilating a kid in this manner. He also states that they pull down and eat corn when it is in the 'roasting ear' stage."[7]

"Its food," says Audubon, "consists in part of grubs, beetles, and other insects, and occasionally a small quadruped or bird, the eggs of birds, and, in fact, everything which this carnivorous but timid animal can appropriate to its sustenance."[8]

Again, Bailey says: "The stomachs of three adults were filled with

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[4] Texas, p. 203.

[5] As above, p. 205.

[6] W. A. N. A., p. 584.

[7] As above.

[8] Q. N. A., II, p. 20.

ground-up insects—mostly beetles—with a few grubworms, large brown flies, and grasshoppers."[9]

"They were feeding on beetles, grasshoppers, crickets, and the ripe fruit of the prickly pear (*Opuntia engelmanni*)."

"One of the Skunks shot by moonlight early in the evening on his digging ground had already filled his stomach with these crisp, juicy beetles to the number of several hundred In skinning him the next morning, I was struck with the adaptability of his long, naked nose to the work of probing the beetle holes. A sniff would probably show whether the beetle was at home and worth digging for, or whether the hole was occupied by a tarantula."[10]

"This species apparently takes the place of the common American Skunk (*Mephitis chinga*) in the vicinity of the ranchos and plantations of the Mexicans, and is quite as destructive to poultry, eggs, etc., as its Northern relative."[11]

Skin and Parasites

"No use is made of their skins in this country or in Mexico, but the gigantic natives of Patagonia make robes of them, which are worn like great cloaks."[12]

"The stomach of the specimen from which our drawing was made," says Audubon, "contained a number of worms, in some degree resembling the tapeworm at times found in the human subject. Notwithstanding this circumstance, the individual appeared to be healthy and was fat."[13]

Its Way of Life

Far less is known concerning the habits of Hog-nosed Skunks than of others in the group.

"Owing to their strictly nocturnal habits, they are much less frequently seen than the Common Skunks, even in localities where they are numerous. In fact, it is only within the last few years that their presence in many parts of the southwestern border has become known."[14]

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[9] Texas, p. 205.

[10] Texas, p. 203.

[11] Q. N. A., II, p. 20.

[12] W. A. N. A., p. 584.

[13] Q. N. A., II, p. 20.

[14] W. A. N. A., pp. 583–84.

"The scarcity of specimens of *Conepatus* in collections is not due entirely to the scarcity of the animals. In several localities where they were common, and their long-clawed tracks and peculiar diggings were abundant and fresh every morning, I utterly failed to trap them, as they would not come near any kind of bait that I could offer; but in these localities, their favourite food—large brown beetle—was abundant. Near Boquillas, in the side cañons of the Rio Grande, the mellow sandy bottoms were pitted with little funnel-shaped holes about 2 inches deep, where the animals had dug out the beetles, whose round holes perforated the ground on all sides like half-inch auger holes."[15]

"On the highlands of Mexico, I have many times camped in localities where patches of ground were rooted up nightly by these Skunks, to a depth of two or three inches, as thoroughly as might have been done by small Pigs. In such places, I repeatedly failed to capture them by traps baited with meat, the insects and grubs they were finding apparently being more attractive food. I have had similar failures in trapping for Coyotes with meat bait, in localities where they were feeding fat on swarms of large beetles and crickets. The persistence with which the Hog-nosed Skunks hunt insects renders them a valuable aid to farmers."[16]

"This and two other specimens, which I failed to shoot in such a way as to break their backs and prevent the discharge of their scent gland, curled up with their last gasp, and drenched their bodies from head to tail with the reeking fluid, which differs neither in quantity nor strength from that of *Mephitis*. The repetition of this act by the two individuals indicates a habit not shared with the Common Skunk, which, to its last breath, tries to avoid soiling itself in using its weapon of defense. In general, the habits of *Conepatus* and *Mephitis* are very similar, even to a choice of the same brush patches and gulch bottoms for foraging ground. They must frequently meet, whether on friendly terms or otherwise."[17]

"Along Devil's River, in July, *Conepatus* was common, but as usual was difficult to catch. One got into a trap set in a trail, and another was shot by moonlight as it trotted through camp."[18]

"They have a curiously stupid, sluggish manner, and have even less vivacity than the somewhat sedate Common Skunk."[19]

"The long and beautiful tail of this Skunk makes it conspicuous among

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[15] Texas, pp. 202-03.

[16] W. A. N. A., p. 584.

[17] Texas, p. 203.

[18] As above, p. 203.

[19] W. A. N. A., p. 584.

the thickets, or in the mesquite bushes of Texas, and it most frequently keeps this part elevated so that in high grass or weeds, it is first seen by the hunters who may be looking for the animal in such places."[20]

F. W. Miller tells me that it digs up large areas exactly in Hog fashion, but so far, no one has found a bait that will lure it into a trap.

References for Hog-nosed Skunk

1849—Quadrupeds of North America, by Audubon & Bachman, II.
1905—Biological Survey of Texas, by Vernon Bailey, N. A. F., 25.
1918—Wild Animals of North America, by E. W. Nelson.

[20] Q. N. A., II, p. 20.

LIFE XXX—LITTLE SPOTTED SKUNK

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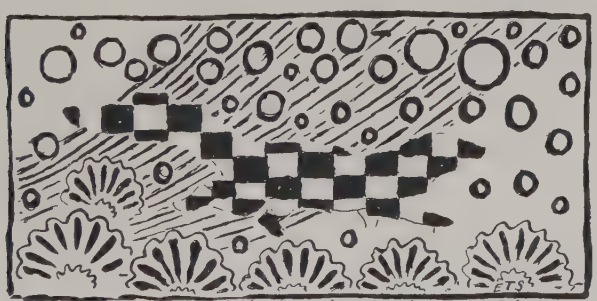

Spilogale running through the Grass during a Shower of Rain.

Little Spotted Skunk, Hydrophoby Cat, Phoby-Cat, Civet-cat, Pole-cat, Spotted Skunk, Little Pole-cat, Tree-skunk, Marten-skunk, Black Marten, Fourway Skunk, Weasel-skunk, Four-striped Skunk

Spilogale putorius (Linnæus)

(Gr. *spilos*, a spot; *Gale*, a Weasel; L. *putorius*, a stinker)

Viverra putorius Linnæus, 1758, Syst. Nat., ed. 10, I, p. 44.
Spilogale putorius Coues, 1875, Bull. U. S. Geol. & Geogr. Surv. Terr., Ser. 2, No. 1, p. 12 (Part.)

Type Locality—South Carolina.

The genus *Spilogale* includes small, slender, weasel-like Skunks, readily distinguished by the white spots and short broken stripes on their otherwise jet-black coats. They are quick and alert, much more active than the Skunks of the genus *Mephitis;* indeed, they are almost as active as Weasels, and readily climb trees. The pads on both the front and hind feet are divided into four tubercles at the base of the toes. The fur is somewhat finer and closer than that of *Mephitis*, and the tail hairs are unicoloured to the base. In other respects, including food, armament, and dentition, they are much like their large cousins.

Size. Total length ♂'s, $18\frac{1}{2}$ to $22\frac{1}{4}$ in. (470 to 563 mm.); tail, $7\frac{5}{8}$ to $8\frac{5}{8}$ in. (193 to 219 mm.); hind foot, $1\frac{3}{4}$ to 2 in. (45 to 51 mm.).

♀'s a little smaller.

Colour. While no two are quite alike in pattern, the following will be found the prevailing type. General colour, glossy black, with a white spot on the forehead; a white spot on each cheek, just before the ear; 4 longitudinal white stripes along neck, back, and sides, beginning at the head and reaching a little beyond the middle; two bands of white across the hinder back and sides, broken up into about 4 white blots each; a white spot on the rear at each side of the tail; a white spot on the tail base at each side, and a white tuft at the tip of the tail.

"After the first year the white markings are strongly tinged with yellow."[1]

[1] A. Brooks, Recreation, Apr., 1899, p. 253.

Those who have seen the Zebra on his native veldt, say that in the moonlight his vivid black-and-white stripes obliterate his form completely. He is invisible; he has a perfect concealing pattern. So also the Little Skunk, so black and so white in daylight—when he rarely appears—is rendered invisible in the moonlight, by the white spotting which turns his jet-black form into a mere gray place mottled over with soft light.

Races

The following forms have been recognized:

putorius Linnæus, the typical form. T. l., South Carolina.

ambarvalis Bangs, much smaller with very short tail, and white marks much more extensive. T. l., Oak Lodge, Brevard Co., Fla.

interrupta Rafinesque, like *putorius*, but with white spots and tail tip reduced to a minimum. T. l., Upper Missouri.

indianola Merriam, like *interrupta*, but with large white tail tip (about $\frac{1}{4}$ of the upper surface) and smaller narrower skull. T. l., Indianola, Matagorda Co., Tex.

leucoparia Merriam, with white markings large, and skull with greatly inflated mastoid capsules. T. l., Mason, Tex.

tenuis Howell, size, large; white markings prominent, as in *leucoparia;* skull long and narrow. T. l., Arkins, Colo.

gracilis Merriam, like *leucoparia*, in size and colour, but smaller white tail tip, and skull with mastoid capsules less inflated. T. l., Grand Cañon, N. of San Francisco Mt., Ariz.

saxatilis Merriam, much like *gracilis*, but slightly larger, and with lateral stripe usually absent. T. l., Provo, Utah.

ambigua Mearns, colour, as in *gracilis*, but with the highly arched cranium of *ambarvalis*. T. l., Eagle Mt., Chihuahua, Mexico.

augustifrons Howell, size small; colouration as in *ambigua*, but usually without white bands on thighs; skull slender. T. l., Tlalpam, Mexico.

tropicalis Howell, like *augustifrons*, but larger. T. l., San Mateo del Mar, Mexico.

elata Howell, like *tropicalis*, but with less white at base of tail, and with narrower skull and heavier dentition. T. l., San Bartolome, Chiapas, Mexico.

pygmaea Thomas, size, very small; dorsal stripes not broken into patches on hinder parts; a transverse band of white across

face between eyes; middle dorsal stripes grayish. T. l., Rosario, Mexico.

arizonae Mearns, similar to *gracilis*, but with larger and more angular skull. T. l., Fort Verde, Ariz.

martirensis Elliot, like *arizonae*, but smaller. T. l., San Pedro Martir Mts., Lower Calif., Mexico.

phenax Merriam, much like *putorius*, but with shorter tail; skull, heavy and angular. T. l., Nicasio, Calif.

latifrons Merriam, much like *phenax*, but smaller, with more black; rostrum, broader. T. l., Roseburg, Ore.

olympica Elliot, much like *latifrons*, but tail shorter; rostrum, narrower; white spot on forehead, longer. T. l., Olympic Mts., Wash.

microdon Howell, like *phenax*, but smaller, with very small teeth. T. l., Comondu, Lower Calif., Mexico.

lucasana Merriam, very large, marked like *phenax*, but back stripes broader; skull, broad and flat.

Whether there is one or half a dozen species is not yet ascertained. The complexity of the problem is indicated by the map. On this, the type localities are indicated, but not the lines of division or fusion; they are as yet undetermined.

For purpose of life history, I shall treat these energetic and animated checkerboards as one creature, the over-species *Spilogale;* for I find no difference in his habit from sea to sea, other than is imposed by different prey, different surroundings, and different weather.

Range

As shown on the map, the Little Spotted Skunk is a Southern species that has spread northward over half the United States, and sent an outstretched prospecting arm along the warm damp woods of the West, right into British Columbia.

Although the map shows a wide range, this animal is not by any means to be found in all of the region enclosed by the outline. Indeed, it is noted for its erratic distribution; large areas that are within its proper limits are entirely without the species. Some of these gaps are shown, but many others exist, and the only explanation seems to be that the Spotted Skunk is a newcomer that has not wholly possessed the land, and indeed has not yet been fully adapted to such complete possession.

In support of this view, it is interesting to note that neither Audubon

nor Bachman makes any mention of this Skunk, although they spent much of their lives collecting and observing in what is now its established range.

In the early days of Iowa, the Spotted Polecat was apparently unknown; now it is regularly found there.

It was unknown in Minnesota in 1900. At Sioux Falls, So. Dak., Nov. 30, 1905, I met Lee R. Gridley (of Appleton, Wis.), an amateur trapper and naturalist. He told me that in March, 1904, he caught 2 Civet-Cats or Little Spotted Skunks in Minnesota, at a place 40 miles southeast of Minneapolis. They were evidently rare, for none of the natives had ever seen one before.

At Marshallton, Iowa, Feb. 3, 1902, I got a fresh specimen from a trapper and sent it to the Biological Survey. The trappers said that the "Marten-skunk," as they called it, was new in the country, but increasing.

In the older lists, it was never accredited to Illinois or Indiana. Kennicott (1857) seemingly never heard of it there. Cory (1912) lists it for the southern parts of both states. It is another sign of a successful species, when one finds its scouts or prospect-parties turning up at odd places, far beyond the creature's accredited limits. As illustrations of this:

"Merritt Cary, of the Biological Survey, tells me that *Spilogale* is reported by sheep-herders, as occurring on the Caspar plains north of Douglas, Wyoming. He also reports that several Spotted Skunks were killed in the Black Hills, near Elk Mountain, South Dakota, in 1902 and 1903."[2]

"I am informed by S. E. Piper, of the Biological Survey, that he captured two specimens of *Spilogale* at Almota, Washington, in the Snake River cañon, in 1897. These specimens cannot now be found, so that their identity cannot be determined; but they probably are referable to the Great Basin form, *S. gracilis saxatilis*. Although the genus reaches British Columbia on the Pacific Coast, Almota is the most northerly place in the interior from which it has been recorded."[3]

Haunts

When one arrays the observations that tell what are the Spilogale's chosen haunts within its limits, there are two outstanding features that seem contradictory: first, that this little Skunk is happy anywhere; second, that for some reason he wholly avoids certain regions.

Thus Nelson says: "They inhabit a variety of climatic condition, from the rocky ledges high up on the slopes of the Western mountains, to the

[2] Review, p. 7.

[3] As above.

hot desert plains of the Southwest, and to partly forested regions in both temperate and tropical lands."[4]

Bailey's summary is this: "Although, broadly speaking, plains animals, these Spilogales, like most species of the genus, take advantage of any cover in the way of bushes, tall grass, stream banks, or old buildings, that the country offers."[5] Even the burrows of Ground-squirrels provide it with safe harbours. Bailey states also: "Throughout most of its known range, it inhabits rocky gulches, cliffs, and cañons, or the brushy bottoms usual in such places."[6]

"In Florida, it is essentially a prairie dweller."[7]

There is plenty of evidence that it dwells in the woods. Yes, up in the tree-tops at times, when seeking safety; and Howell reports it in Florida, and on the Pacific Coast, as frequenting ocean beaches.[8]

Near Corpus Christi, Tex., Bailey caught the animals in bunches of prickly pear and in Wood-rat houses under the mesquites.[9]

Every type of place, in short, has been enumerated, except deep water, and high bare mountain peaks.

Yet the map shows wide areas surrounded, but not apparently possessed, by the species. The answer may be that the Spilogale is extending his range. He is a successful animal; he is possessing new lands in his onward march; and the long outthrust feelers of his armies go first to regions that are easy, that are near by, that are not possessed of rivals, or those that especially abound in food. It is only a question of this, probably, before all the gaps will be filled. The onward march of the group shows on the map like a northward flow of lava, first in the low valleys; leaving many untouched islands, but rising higher, till, at last, the sheet will be complete.

Numbers

Although apparently increasing in numbers, the Little Skunk is less abundant than its big cousin. The trap-catch during the season 1921–22 on the $10\frac{1}{4}$ square miles of the Spring Valley Water Company near San Francisco, was, all told, 84 fur-bearers, of which there were 18 Big Skunks and "sundry Civet-cats."[10]

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[4] W. A. N. A., p. 578.

[5] Texas, p. 199.

[6] As above, p. 198.

[7] Howell, Journ. Mamm., Feb., 1920, p. 88.

[8] Review, p. 8.

[9] Texas, p. 200.

[10] W. B. Lawrence, Cal. F. & G., Oct., 1922, p. 230.

So also in the California National Forest, during the winter of 1919–20, the trappers took 459 of the Big Skunks, and but 25 of the Civet-cats; that is, about 20 to 1.[11] The area of this forest is 1600 square miles; about 50 trappers operated all winter, so that these results may be considered representative.

Vast numbers of Spotted Skunk skins are now to be seen on our streets in the form of cloaks. A few years ago, the animal was not considered worth skinning.

Weapons and Antics

The liquid musk which the animal uses as a defense is precisely the same in origin and effects as that of the larger Skunk already described. It is an overpowering, blinding, burning, gaseous stench that no man and no animal can face or bear.

The Spilogale, like his big brother, is so sure of himself and his gun, that he commonly faces the enemy, however great, with his tail erected in a warning fashion, to let the foe know that he is courting awful punishment.

Sometimes the Little Skunk will run toward the foe, and then, by way of adding emphasis to the probabilities, will rear up on his fore feet, with hind quarters high in the air. This extraordinary antic is practised by some, if not all, of the Big Skunks, and is probably more or less individual.

Nevertheless, J. S. Duss, Jr., of New Smyrna, Fla., writes me that Civet-cats were quite numerous around his house on the peninsula opposite the town. They were very tame, and it was almost the rule for them to do the hand-stand trick. He had seen several doing the act at one time about the back porch.

Howell records the same habit for the species.[12]

C. E. Johnson, of University of Kansas, Lawrence, Kan., writes at length on the subject. On Dec. 28, 1920, he came upon one of the Little Spotted Skunks in an open field. As the light was good, he followed with his camera and soon overtook it. "The Skunk, which was proceeding at a rather slow, deliberate trot, suddenly threw its hind quarters into the air and actually ran a few steps on its fore legs. . . .

"On three separate occasions, while endeavouring to get a photograph of the Skunk, I quickly stepped up to within 6 feet of it, as it was running before me and each time the animal performed a perfect "hand-stand" act. . . . I hastened after it, and when near enough, threw a clod of earth which struck the ground within a foot or two of its side. Like a flash, the

[11] Cal. F. & G., April, 1920, p. 89.

[12] Journ. Mamm., Feb., 1920, p. 88.

Skunk threw up its hind legs and half faced about, pivoting on its fore legs, and uttered a hissing snarl. The "hand-stand" attitude, however, was not maintained for more than about half a second, the whole performance being but a momentary pause on the part of the animal to defend itself. . . . Altogether, in the relatively short time that I was occupied with this experiment I induced about a dozen of these reactions. . . . A number of times this little beast actually charged me as I stepped in front of it while trying to turn it back, but I retreated hastily and it did not press the pursuit. The last time, however, I held my ground as the Skunk bristled and charged directly at me. When within probably 8 or 9 feet of me it stopped abruptly and elevated its rear end, standing perfectly balanced on its fore legs for what seemed at least a couple of seconds. . . .

"My companion, who had remained an interested spectator from a little distance, declared afterwards that whenever the Skunk rose upon its fore feet a fine spray of vapour could be seen issuing from the vent."[13]

Food Chiefly Insects

Like most of the carnivores in this work, the Spotted Skunk is omnivorous. It prefers and eats whatever flesh or living things it can find or master; all kinds, from ticks to turkeys, are on its list; and if the animal sorts are scarce, it fills up with fruit and vegetables.

Says Frank C. Pellett: The Little Spotted Skunk is a "much-wronged individual. Several different times, we have had them about the place, much to the discomfort of the Rats, and without injury to the poultry. One winter, a colony of Rats established themselves under a big pile of cobs which we used for fuel, and which were stored in the woodhouse. They were beyond the reach of ordinary means, and too sharp for traps or poison. A sleek Cat residing at a nearby farmhouse, had such a reputation as a Rat-catcher that we borrowed her and confined her in the building, without apparent result. The Rats were as abundant and destructive as ever, until we returned the Cat in disgust. About that time a little Skunk moved into the woodhouse. The Rats were promptly moved out, and not a sign of a Rat was to be seen for many months. The same process was repeated again the past winter, with the same result. In neither instance did the Skunks trouble the poultry, although they were within easy reach.

"These little Skunks are often caught in steel traps set in Pocket-gopher burrows, which indicates that they assist the Weasels in keeping

[13] Journ. Mamm., May, 1921, pp. 87–89.

the Gophers in check. In my opinion, however, Mice and insects form the principal food of these animals.

"In contrast, let me mention a Cat case that came to my notice. The owner of the Cat had a large number of young chickens some of which were regularly missing. The missing chicks, of course, were charged to Skunks or Weasels, and a watch was kept for their appearance. Great was the surprise when, on looking out of the window, the House-cat was observed to creep from under a shed, and, after taking a hasty survey to make sure that no one was about, seize a chick and run back under the shed. The Cat was, of course, put out of the chicken-killing business on short notice, and the number of chicks was not further unaccountably diminished.

"My observations lead me to the conclusion that chicken-killing is not more common among Skunks and Weasels than among Cats. And that if Cats should be protected, these wild things should likewise be encouraged."[14]

The following observations by Howell[15] are of value:

"The food of the Spotted Skunks, judged by the records of 17 stomach examinations made by the collectors of the Biological Survey, consists in large measure, of insects, chiefly beetles and grasshoppers. These are supplemented by Mice and other small mammals, lizards, salamanders, small birds, and crayfish. One stomach contained persimmons, and several species of fungus.

"In some localities, these Skunks are known to destroy hens' eggs, and doubtless wild birds' eggs also are frequently eaten. Most of the reports received by the Biological Survey with reference to damage done in the poultry yard by the Spotted Skunks come from the Pacific Coast, where they are particularly abundant.

"S. E. Piper, of the Biological Survey, examined a Spilogale den in the Holston Mountains, Tennessee, and found in it the remains of 3 Gray-squirrels (*Sciurus carolinensis*). The capture of so large a mammal as a Squirrel by these Skunks is, however, unusual.

"The Spotted Skunks doubtless do much good in destroying Rats. H. C. Oberholser, of the Biological Survey, reports that at Port Lavaca, Tex., they are known to capture Wood-rats (*Neotoma*), which they secure by following them into their runways."

In the stomach of a specimen taken by Lloyd in Matagorda Co., Tex., "were found parts of a *Perognathus hispidus* and some crawfish," while the

[14] Forest & Stream, May 14, 1910, p. 772.

[15] Review, pp. 88-89.

stomach and intestines of specimens taken near Galveston "contained only shells and legs of a large brown beetle which swarmed about the houses at night. A few legs and wings of grasshoppers were found in the lower intestines of one individual."[16]

"Recorded observations on the food habits of the Spotted Skunks seem to indicate that, while in regions where they are abundant they destroy more or less poultry, the fact that their diet consists chiefly of injurious rodents and insects entitles them to be considered valuable allies of the farmer; and their presence about the farm should be encouraged."[17]

"Their diet is fully as varied as that of others of the Weasel kind," says Nelson, "but is made up mainly of insects and other forms injurious to agriculture, including grasshoppers, crickets, beetles, and larvæ of many kinds. They feed also on flesh, whenever possible, and prey on Wood-rats, Mice of many kinds, small Ground-squirrels, small birds and their eggs, young chickens, lizards, salamanders, and crawfish. This carnivorous diet is further varied with mushrooms, peanuts, persimmons, cactus fruit, and other small fruits. Sometimes the animals locate about occupied habitations in primitive communities, where they give good service by killing the House-rats, Mice, and cockroaches on the premises. On one occasion, a Spotted Skunk was detected cunningly removing the downy chicks from under a brooding hen without disturbing her."[18]

One of the most curious and suggestive "food-observations" at hand, is the following by Frank C. Pellett, of Atlantic, Iowa: "Occasionally a small Spotted Skunk is caught in the same trap with a Rabbit, apparently following Bunny into his retreat, both being caught together. Twice this has happened with us this winter."[19]

As Ratter and Mouser

We have catalogued his food, and tried—though knowing the attempt absurd—to say "good" and "bad" to each item. We have noted that the Spotted Skunk eats birds and eggs, and even desecrates the henhouse sanctuary; which, though a rare offense on his part, has made for him many enemies. Nevertheless, he has another food and prey habit that should atone for all the above-named indiscretions.

"In British Columbia," says Allan Brooks, "they often take up their abode about houses or outbuildings, and in my judgment, do far more good

[16] Texas, p. 200.

[17] Review, p. 9.

[18] W. A. N. A., p. 578.

[19] Forest & Stream, Feb. 25, 1911, p. 291.

than harm. They do not seem to bother poultry, but destroy large quantities of Mice, which more than counterbalance the value of any eggs they may steal.[20]

D. E. Lantz, of the Biological Survey, also has recorded an instance where a Spilogale proved to be a valuable aid in destroying House-rats and Mice. He says:

"At one time, my family occupied for two years a house with large cellar openings on the outside. . . . The cellars, and in fact the entire house, were overrun with Rats and Mice. A couple of months after we had first occupied the house, I noticed that a Little Striped Skunk was present in the cellar. We could often hear the fights between it and Rats, and I was careful not to disturb it when I went to the cellar for coal. I often saw it in the cellar, and it did not seem to fear my presence there. In a very few weeks, we could hear no more of the fights with the Rats, and all the Rats and Mice were either killed or driven from the place."[21]

C. J. Maynard, writing of the Florida species, says:

"These Skunks are easily domesticated, and I have frequently known of their being used in the houses for the purpose of catching Mice. Sometimes the animals are captured and the scent glands removed, but they are often simply decoyed about the premises by exposing food, when they will take up their abode beneath the buildings, and will soon become so tame as to enter the various apartments in search of their prey."[22]

The One Fell Enemy

Fear enters but little into the life of Spilogale; just enough to save him from foolhardiness. A thornbush, a hole in the ground, or a dash up a tree, are his answers for three different kinds of attack; and for yet others, of larger power and deeper terror, he has his invincible musk-gun, his poisonous gas.

But there is one among those native to its range, that the Little Skunk has reason to fear more than all the rest put together. That enemy, as with the Big Skunk, is the great horned owl. Swift of flight is he, silent as dew-fall, stronger than ten Skunks, keen-eyed as a Lynx, fierce as a Tiger; and when out of the midnight canopy he drops on the gliding black-and-white prowler, one irresistible grapnel clamps on its neck, the other in its loins. Bereft of both sets of weapons, musk and fang, fore and aft, the

[20] Recreation, April, 1899, p. 255.

[21] Quoted by Howell, in Review, p. 9.

[22] Quoted by Howell, in Review, p. 9.

Little Skunk is a helpless prey, and the grisly tragedy of it is sufficiently set forth in such colourless records as this:

"Under the nest of a great horned owl in the face of a cliff at the west base of the Davis Mountains, I found several jaws of these Little Skunks in the owl pellets."[23]

Mating, Den, and Young

The analogy of other Skunks would indicate that the species is polygamous. One male mates with as many females as he can find and win, during the brief breeding season, which is in late winter.

The den is often a natural cavity in the rocks, or a convenient crevice under a stone pile, but sometimes a hollow log or a stump is used. Out on the plains or other level lands, the Spotted Skunk often digs a burrow for itself under the cactus and thorny underbrush; or more often, it uses the deserted burrow of some other animal, such as a Ground-squirrel or a Woodrat, or in Florida, even that of a burrowing owl.

Howell examined a den in South Carolina that was dug under the roots of a fallen tree. Others have nested under or about ranch buildings. At Hutchinson, Kan., I found one living merrily among the vast food possibilities of a grain elevator.

So far, no one has reported the nest in a wet place or high up in a hollow tree.

The most extraordinary record is by Nelson who says: "On the plains of Arizona, they have been known to live inside the mummified carcass of a cow, the sun-dried hide of which made an impregnable cover."[24]

The young are said to be 2 to 6 in number; 4 or 5 is usual; but the mother's teats are 6 to 10, so that it is probable she may at times have as many kittens as the bigger Skunks; that is 8 or 10.

The Dreaded Phoby-cat

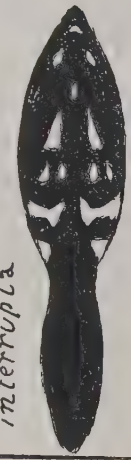
Most travellers, on first seeing the native houses in the Southwest, are struck by the fact that each room is separate and has its own way out. Also, that that doorway has an inconveniently high step-up even when it steps down again into the room. The reason given to me long ago for this inconvenient arrangement is that it is done to keep out the Phoby-cat.

And this was the accepted faith: The Little Spotted Skunk or Hydrophobia-cat had the power, at any time, to infect any one, or any animal,

[23] Texas, p. 198.

[24] W. A. N. A., p. 578.

hutonius



interrupta

Marshalltown. Ia. fresh specimen. 3. Feb. 1902. by E.T.S.

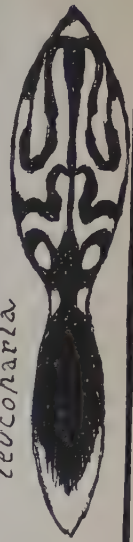
3. Feb. 1902

Rt. hind 1/1

Rt. front 1/1

from dry skin
Am. Museum 8 1275

E. T. Seton



leucoharia

hyemalis

Plate LXIII. —— Spotted Skunk – details & races.

with rabies, and delighted in going about the country at night, seeing how much mischief it could do in this diabolical way.

Further—according to the creed—the bite is sure, slow death, unless a gallstone can be procured, boiled in milk, and speedily laid on the wound. This must be held there until the stone turns green, then boiled again, and applied as before 10 or 15 times. If then, the stone no longer turns green, the poison has been sucked out and destroyed. These gallstones are found in the bladder of a Deer, and are esteemed priceless. A famous gallstone at Springer, N.M., had a record of saving many lives in the early '90's; and was in constant request during my residence in that region.

Such are the legends. Now for the facts. At first, the men of science scoffed at the whole story as absurd on the face of it. Then, some undoubted cases of rabies were produced, showing that it was not without foundation. Now we are somewhere near the truth, which is, of course, in the middle of the road. Rabies does appear occasionally, no one knows of what origin, and spreads among flesh-eating animals of the Southwest. Coyotes are often afflicted. As they go rushing madly about in the extreme stages of the disease, they bite and infect whatever creatures they meet. The Skunks, both big and little, not being much accustomed to fly from their enemies, stand their ground, are bitten, and go rabid. This is especially true of the Big Skunks which are too slow to escape the mad Coyote. They go mad, and spread the madness till death claims them.

It is strange that the name "Phoby-cat" should have been applied to the Little Skunk, for the Big Skunk is much more apt to get and give the disease. In answer to the statement that the bite of a Big Skunk always conveys rabies, I would say that I have been bitten a dozen times, sometimes very deeply on the bare hand by my Skunks, and I have seen several Skunk-farmers bitten severely, but none of us has suffered any dreadful aftermath.

Personally, I have never met with a case of Skunk rabies; but E. W. Nelson, after living much in the Southwest and giving special attention to the subject, writes:

"That the Little Spotted Skunk is subject to rabies and has communicated it to many men in the West is unquestionable. It usually bites men who are sleeping on the ground in its haunts, as they commonly do on the Western stock ranges.

"I have personally known of several instances in northern Arizona of men being bitten by them. The head, face, and hands, being uncovered, are the points attacked. One man in the mountains south of Winslow, Arizona, was bitten on the top of his head in April, 1910, but paid no attention to the slight wound, until two months later, when he began to

PLATE LXI.—SKUNKS FIGHTING FOR A PIECE OF MEAT, WHILE THE FOX JUDICIOUSLY HOLDS ALOOF. THE COMBATANTS DID NOT USE THEIR MUSK
Scene described by L. W. Walker of Yellowstone Park

PLATE LXII.—THE SPOTTED SKUNK
Drawing loaned by New York Zoölogical Society

have spasms. He then hurried to town and died in great agony the next day. The year following, a man in the same district was bitten in the face, and seizing the animal, threw it from him in such a manner that it fell on his brother and bit him before he awakened. Both men were given the Pasteur treatment and had no further trouble.

"On New Year's night of 1906, while I was at the village of Cape San Lucas, at the extreme southern end of the Peninsula of Lower California, a large-sized old male Spotted Skunk entered the open door of a neighbouring house and bit through the upper lip of a little girl sleeping on the floor. Her screams brought her father to the rescue, and, with a well-aimed blow, he killed the offender. The next morning the Skunk was brought to me and added to my collection. As I left a few days later, I never learned the result of this bite, but while there, was informed that a man had died the previous year from a similar bite. The occasional instances of this kind are remembered, and appear more numerous than they are in fact. For years, many men have slept in the open where these animals abound, without being molested. It is interesting to find that, when the voyager Duhaut-Cilly visited the Cape in 1826, the natives feared these Skunks, because they entered houses at night, biting people and infecting them with hydrophobia."[25]

The conclusion is that the Little Spotted Skunk does on rare occasions get hydrophobia, just as Dogs do; and if one enters camp at night, and bites some sleeper, it is good proof that the animal was mad, and the victim should at once seek the Pasteur treatment at the hands of the nearest doctor. Don't waste time over the "madstone"; that was a faith cure, pure and simple, and worked only when it wasn't needed.

Nevertheless, I and some of my friends have slept out for years in the land of the Little Skunks, have passed a total of many thousands of nights in camp, and never once met with one of the Phoby-cats on the rampage. The chances are about a million to one against it.

Curious Incidents

The following from Bailey's "Texas," are of unusual interest:

"At Canadian, Texas, one was caught in a No. O steel trap set in an old tumbledown shed in the corner of a field, and baited with the bodies of birds that had been skinned for specimens. I had with me a bottle of bisulphid of carbon for experiments on Prairie-dogs. Thinking to try a new experiment, I scraped a hollow about 8 inches deep in the sand, and with a stick, gently loosened the trap chain, and slowly drew the little Skunk to the

[25] W. A. N. A., p. 579.

hole. He tumbled in, thinking he had escaped, and curled up in the bottom. I then poured a couple of ounces of bisulphid on a bunch of grass and threw it into the hole, and after waiting five minutes, found the Skunk dead and perfectly free from unpleasant odour. This method of killing any of the Skunks, when it becomes necessary to trap them around buildings, can be safely recommended."[26]

"At Virginia Point, on the prairie opposite Galveston, I trapped a Skunk one morning in a bunch of cactus and, by a bungling shot, allowed it to discharge its odorous fluid. Being anxious to save the skin in spite of its odour, I sat down on a patch of dry sand to skin it, and in a few minutes a black shadow passed me on the ground. Looking up, I saw not less than 50 turkey-buzzards and black vultures beating up the wind in a long line straight toward me. They were flying low and keenly scanning the ground. Many came within 20 feet, apparently before seeing me, and soon I was the centre, though not the object of attraction, of the constantly increasing flock. As my work ended and I moved away, they pounced on the carcass, and soon there was nothing but the large scent gland and its odour to mark the spot. Even the bones had mostly disappeared. This is but one of many similar instances in which turkey-buzzards and vultures have quickly responded to the smell of a freshly killed Skunk, although they usually leave a cleanly picked skeleton as well as the scent gland."[27]

His Way of Life

Strictly nocturnal is this little animated checkerboard. No one, so far, has recorded him abroad, of his own free will, when the sun was up. Moonlight he tolerates for the obvious reason that he must eat every night, and a moonlight ramble is better than starvation. Those who know only the slow-moving, calm, self-confident Big Skunk, must recast their ideas to fit the Spotted one—restless as a Weasel, running, bounding here and there, diving out of sight in some underground runway, or racing along logs, scrambling up a tree, if any alluring smell be from that way wafting. So much at home up aloft is he that he commonly retreats there when he must escape from such a crowd of foes as a pack of hounds.

Bailey describes the Spotted Skunks dodging in and out among the big bunches of cactus near Galveston: "Such confidence," says he, "had they in the protection of these thorny masses, that one came out repeatedly, thrusting its head between the cactus blades to watch me with its keen little eyes, first at one window then at another, moving about freely among

[26] W. A. N. A., pp. 199–200.

[27] As above, p. 201.

the thorns, and refusing to enter its burrow even when I approached to within a few yards."[28]

Merry and frolicsome is he at all such times, and one has to labour hard, and blink one's mental eyes, to recognize in this elegant and amusing sprite the dreaded Phoby-cat that has forced a million Mexicans to build a million extra barriers at the million doorways of their houses.

A bad name goes far to make us say bad things about a character that we do not know; and yet, as Charles Lamb said, "to know a man well is usually to love him." E. W. Nelson has been blessed with closer friendly contact with this Skunk than have most of us, and his remarks as follows are pleasantly enlightening:

"The Little Spotted Skunks," he says, "have extremely animated, playful natures, as I have had several occasions to observe. Two instances serve to illustrate this. Once at the mouth of a cañon at the southern end of the San Joaquin Valley, California, I camped several days at a deserted ranch. At night, I spread my blankets on the bare floor of the house, from which the doors were gone. Under it led several burrows of some animal which I at first supposed to be a Ground-squirrel. Each night, while there, I was awakened by the sound of little footfalls padding rapidly about over the floor on which I was sleeping, and in the dim light from the moon, could see two or three Little Spotted Skunks pursuing one another around me like playful kittens. At the slightest movement on my part, they dashed out the door and into their dens under the house. As there was no food of any kind in this room, it was evident that the little fellows were there for a frolic on the smooth board floor.

"On another occasion, in the mountains of San Luis Potosi, on the Mexican tableland, I found a spring to which Bears were coming for water at night. As the Bears here appeared to be strictly nocturnal, I ensconced myself in the evening with a dark lantern, amid some small bushes, against a large pine log which sloped downward to the bottom of the gulch near the spring, with the plan to welcome any Bears which might come in. An hour or more after dark, the clinking rattle of small stones on the far side of the gulch indicated the presence of some animal. The light from the lantern was flashed on the spot, and the rifle lowered with exasperation as, running back and forth, turning over stones in search of insects, a Spotted Skunk was revealed. The movements of this unwelcome visitor were extremely light and graceful, and, in my interest in watching them, for a time I forgot the Bear. Two or three hours passed, and the Skunk tired of the hillside and came down to the spring, where he found the offal from a Deer which I

[28]Texas, p. 200.

Plate LXIV. Tracks of Common Skunk & of Spotted Skunk,
in one inch of snow otherwise the heel does not usually show; hind claws rarely show.
Common Skunk. life-size
1 foot
Galloping
Walking.
9 in.
Bounding
3
Walking
Spotted Skunk Hutchinson, Kas. 1/
11 Feb 1902.
by E. T. Seton.

had placed there for bait. This gave him more to do, and after I had listened to him worry the meat for awhile, I turned on the light and was entertained by the sight thus revealed. The Skunk appeared to have a persistent desire to drag away the offal many times his weight. He would seize the edge of one of the lungs, and after a hard struggle, would get it up on one edge, when the burden would turn over with a flap, whirling the Skunk flat on his back each time. Immediately scrambling to his feet, he would give the meat a fierce shake of resentment, and repeat the performance.

"After a long time, the moon arose and the Skunk could be plainly seen running back and forth playfully, now biting at the meat, and now turning over stones, apparently in sheer exuberance of spirit. Then he suddenly mounted the lower end of the log, and came galloping up it until he was close to my shoulder. There he stopped and, coming as near as possible, extended his nose within a few inches of my face, and for a minute or more stood trying to satisfy himself about this strange object. Satisfied at last, he turned and galloped back down the log and resumed his antics in the gulch, finally working close to the bank three or four yards below me. There he found many small stones, and had a fine time rattling them about, until I decided that, with this disturbing presence, I should have little chance for other game. Finding a convenient stone, and locating the Skunk as well as possible from the sound, I tossed it over to try and frighten him away. My aim was too true, for the characteristic Skunk retort filled the air with suffocating fumes and I immediately lost interest in further Bear-hunting."[29]

It is fitting that this brief sketch of the Spotted Skunk should begin with his visible form, and end with his fearful smell. Brief though it be, it embodies all that I can find on record of his way of life. He is, as has been shown, a Skunk with the powers and habits of a Weasel; which means that he is a killer of the little folk of the wood—he is an Ogre among the Brownies.

But he is also an Ogre among the Imps; for the countless pernicious, devastating bugs in bug-land that pollute and destroy, find in him a tireless and implacable foe. So that the men of autopsies, and of material facts, proclaim a heavy balance of benefit in favour of the Weasel-skunk, when a fair appraisal of his ways is made.

References for Little Spotted Skunk

1905—Biological Survey of Texas, by Vernon Bailey, N. A. F., 25.
1906—Review of the Skunks of the genus Spilogale, by A. H. Howell, N. A. F., 26.
1918—Wild Animals of North America, by E. W. Nelson.

[29]W. A. N. A., p. 579.

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Wolverine, Wolvering, Glutton, Carcajou, Karkajou, Skunk-bear, Quiquihatch, Quickhatch, or Keewaharkess

Gulo luscus (Linnæus)

(L. *Gulo*, from *gula*, a throat, given on account of its supposed gluttony; L. *luscus*, half-blind)

Ursus luscus Linnæus, 1766, Syst. Nat., XII, ed. I, p. 71.
Gulo luscus Sabine, 1823, Franklin Narr. Journ. Polar Sea, p. 650.

Type Locality—Hudson Bay.

French Canadian, *le Carcajou.*
Cree, *Kin-kwa-har-gay-o*, or, according to Richardson, *Okee-coo-haw-gew.*
Ojibway and Sauteaux, *Kween-go-ar-gay.*
Chipewyan, *Nog-gy-ay.*
Yankton Sioux, *Skay-cha Tung-ka.*
Eskimo Boothia Felix, *Ka-e-week* (J. C. Ross).
" Melville Pen., *Kab-le-a-rioo.*
" N. W. Alaska, *Kap-rik* (R. M. Anderson).
" Mackenzie, *Kap-vik* "
" Coronation Gulf, *Kal-vik* "

Some have thought that the name *luscus*, half-blind, was given on account of the creature's reputation for bad eyesight. But we are told that "a figure and description of a living Wolverine, received by Sir Hans Sloane from Hudson's Bay, were given to the world by Edwards. . . . The specific name applied to this animal by Linnæus originated in Sir Hans Sloane's specimen having, through accident, lost an eye."[1]

The name "Carcajou" is probably a French corruption of the Canadian Indian name. Richardson believed that both "Carcajou" and "Quickehatch" were derived from the Algonquin or Cree name, "Okee-coo-haw-gew" or "Okee-coo-haw-gees," through the intermediate form "Keewaharkess," often heard in Manitoba during my early days. Thomas Hutchins, of Hudson Bay fame, gives "Quiquihatch."

"The celebrated half-breed, John Hunter, informed me that it was

[1]App. to Parry's Second Voyage, 1825, p. 292.

called 'Gwing-gwah-gay' by the Indians of his tribe, which he interpreted 'a tough thing,' or, as he afterwards explained it, 'a hard character,' in allusion to its mischievous disposition. He assured me that he had known it to be domesticated, and employed by the Indians to catch Beaver."[2]

It is a deplorable fact that, in Ontario, the name "Wolverine" was sometimes misapplied to the Lynx.

The name "Skunk-bear" is commonly used in the Rocky Mountains, because, in size, colour, shape, and smell, the Wolverine suggests a cross between a Skunk and a Blackbear.

The genus *Gulo* (Pallas, 1780) comprises the largest of the Weasel family, and belongs to the *Mustelinae* or true Weasel sub-family, characterized by having partly retractile claws suited, not for digging, but for climbing. They are stout, bear-like animals with bushy tails, hairy soles, short ears, and 4 extra premolars. The teeth are:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{4-4}{4-4}\text{; mol. } \frac{1-1}{2-2} = 38$$

In addition to these characters, the Wolverine has:

Size. Average length of 4 ♂'s, 41⅝in. (1,051 mm.); tail, 8½ in. (212.5 mm.); hind feet, 7⅞in. (198.5 mm.) (R.M.A.). Height at shoulder 12 in. (305 mm.).

Of 7 ♀'s, measured by Anderson, the average length was 37 in. (940.7 mm.); tail, 7⅛ in. (183.5 mm.); hind foot, 7 in. (177.5 mm.).

The specimen described by Baird measured: Total length, 45 in.; tail, 9 in. This "was brought to Fort Union from some of the posts towards the Rocky Mountains."[3]

Weight. Walter Fry, writing of the California Wolverine in Sequoia Park, 1921–22, says: "Three animals were taken. All were fine specimens, and in excellent condition. The largest weighed about 25 lbs."[4] Cartwright gave the weight of a specimen as 26 lbs.[5] A famished ♀, taken by J. C. Ross, weighed 27¾ lbs.[6] R. M. Anderson gives as actual weights of ♂'s, 30, 33, and one estimated at 35 lbs.; of ♀'s, 22 and 23 lbs.

Colour. General colour, a deep blackish brown, paler and grayer on crown and cheeks; a band of pale chestnut begins on each shoulder,

[2] DeKay, Nat. Hist. of N. Y., 1842, p. 28.

[3] Pac. R. R. Rep., Mammals, 1857, p. 182.

[4] The Wolverine, p. 130.

[5] Sixteen Years, II, p. 407.

[6] App. Ross's Second Voy., 1835, p. ix.

and passes backward along the sides to meet its fellow on the tail; these become nearly white on the rump in some specimens; the throat and chest are more or less spotted with yellowish white, which sometimes forms a large irregular patch; claws, whitish horn-colour. Extremely variable, "from almost black with purplish, to a light yellowish and buffy."[7]

Sexes alike, except that usually the paler ones are females.

Races

The following American forms of Wolverine have been recognized:

luscus Linnæus, the typical form. T. l., Hudson Bay.

luteus Elliot, of general pale colour. T. l., Mt. Whitney, Tulare Co., Calif.

hylaeus Elliot, a very dark form, without buff on body or gray on head. Skull, narrow, with greatly enlarged bullae. T. l., Susitna River, region of Mt. McKinley, Alaska.

In addition to these, Matschie of Berlin has recently named 4 other supposed forms. These, R. M. Anderson says, "are untenable. They seem to be based on colour of fur, and can all be matched in my *luscus* specimens."[8]

History

The earliest mention I find of the Wolverine or Carcajou, is by Lahontan in 1703. He writes:

"Dated at Boucherville, [Quebec, south of the St. Lawrence] May 28, 1687. In the beginning of September, I set out in a Canow upon several Rivers, Marshes, and Pools that disembogue in the Champlain Lake."[9]

. . . . . .

"To gratifie the curiosity I had to see such diversity of Animals, they made a diligent search for the Holes or dens of the *Carcaioux*, and having found some at the distance of two or three Leagues from the Fen upon which we were posted, they conducted me to the place. At the break of day we planted our selves round the Holes with our Bellies upon the Ground; and left some Slaves to hold the Dogs a Musket-shot behind us. As soon as these Animals perceived Daylight, they came out of their Holes, which were immediately stop'd up by the Savages, and upon that the Dogs fetched 'em up with ease. We saw but two of 'em, which made a vigorous

[7] R. M. A.

[8] Personal letter.

[9] New Voyages to North America, Reprint of English Ed., 1703, publ. 1905, p. 108.

defence against the Dogs, but were strangled after a dispute of half an hour. These Animals are not unlike a Badger, only they are bigger, and more mischievous."[10]

Range

Wolverines are found in boreal Asia, Europe, and America.

The primitive range of the species in America was limited on the south, and very exactly, by the southern edge of the Canadian fauna; on the north, it extended to the edge of the mainland along the Polar Sea; but also was found on many of the polar islands.

Its area of chief abundance, if such a term can be applied to a creature everywhere scarce, is the Hudsonian and Barren-Ground belts across the continent from Labrador to Alaska; north of this and south of it, it is rare. All records in the United States and on the polar islands are noteworthy.

In Canada and Alaska

Ontario and Quebec. In Bachman's day, these two Provinces *were* Canada, and he says of the Wolverine: "It occurs in Canada, although diminishing in numbers the farther we proceed southerly."[11] We have already noted Lahontan's record for Quebec, south of the St. Lawrence.

Mark Robinson, Chief Ranger of Algonquin Park, writes me, May 13, 1925: "I have never seen or heard tell of a real Canadian Wolverine, south of the Northern Divide. They keep more to the forest bordering on the Barren Lands. There are many trappers along the Ottawa River and branches, that will tell you the Wolverine is quite plentiful, but when you see it, it is nothing more than the light gray 'Canada Lynx,' as far from a Wolverine as day is from night. I have talked with many experienced trappers, and found none who had ever seen a real Wolverine. The Indians tell me the real thing is near the Barren Lands. The Fisher is the nearest to the Wolverine among the animals in the Park."

Since the Wolverine was found in New England, New York, Pennsylvania, Ohio, and Michigan, it is reasonable to assume that it was found also in the Ontario Peninsula. Yet I find not one reliable record to prove it. Major Strickland reports the killing of a Wolverine in Asphodel Township, Peterboro Co., Ontario, in 1849.[12] But his narrative refers to a Lynx, so far as total lack of description would indicate.

It is unknown in southwestern Manitoba, and very scarce in the

[10]As above, p. 111.

[11]Q. N. A., I, p. 211.

[12]Twenty-seven Years in Canadian West, 1853, II, p. 188.

northeastern half of the Province. I have heard of it about Lake Winnipeg, am told that a few are found on Duck Mountain, and in 1885, William R. Hine, the taxidermist of Winnipeg, had a specimen sent him from Brokenhead River. He considers the Wolverine exceedingly rare in Manitoba. The only one he ever saw alive in the Province, was kept at the Albion Hotel, Winnipeg, by Dan MacDonald. It came from Lake Winnipeg.

"There are a few Wolverines on the higher mountains of Vancouver Island, but they are rare, and but very seldom trapped."[13]

Dr. James E. DeKay is responsible for the following: "The Wolverine was formerly found as far south as Carolina, but its southern limits at present, do not extend south of the 42nd degree."[14] I have found no other testimony for such a southern extension.

D. G. Elliot records specimens from New Brunswick, [15] and J. B. Tyrrell gives it as "formerly found in New Brunswick."[16] "Some 30 years ago, it was occasionally met with; but no recent instance of its occurrence is known."[17]

The species was never known on Prince Edward's Island, in Nova Scotia or New Brunswick, on Anticosti, or Queen Charlotte Islands. So that it is with some surprise that we note the next item.

"We have seen specimens procured at Newfoundland."[18] These were skins, and the record is not accepted. Nevertheless, Matschie, the German zoologist, has recently (1918) described this Newfoundland form as *auduboni*.

Bangs does not mention it in his "List of Mammals of Newfoundland," and, for the present, it is well not to accept the record.

Alaska. "The Wolverine was never seen by any of our parties, nor reported by the natives. Wolverine skins, however, are very plenty among the Eskimos and highly valued for trimmings. . . . All these skins are brought from the interior, and are generally obtained by trading."[19]

"The Wolverine is found over the entire mainland of Alaska, but is most numerous about the headwaters of the Yukon and Kuskoquim rivers.

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[13] H. S. Swarth, Birds & Mamm., Vanc. Id., Univ. Calif., 1912, p. 101.

[14] Nat. Hist. N. Y., p. 28.

[15] Proc. Bio. Soc. Wash., Feb. 21, 1905.

[16] Mamm. Can., Proc. Can. Inst., April, 1888.

[17] Mamm. N. B., by Montagu Chamberlain, Bull. Nat. Hist. Soc., N. B., 1892.

[18] Q. N. A., I, p. 211.

[19] John Murdock, Exped. Pt. Barrow, 1885, p. 94.

They are not rare wherever spruce timber occurs, but are very uncommon on the open coast barrens, although they occur there, and extend their range north to the extreme limit of the mainland at times."[20]

On the Polar Islands

Capt. J. C. Ross, 1829–33, wintered at Felix Harbour and Victoria Harbour, which are on Boothia Peninsula at the south end, east side. He says:

"We now know that it remains throughout the winter as far north as the 70° of latitude. . . . A few days previous to the arrival of the Esquimaux near Felix Harbour, in January, 1830, the tracks of this animal were first seen; and soon after, the skins of 2 old and 2 young ones were brought to the ship by the natives, who had taken them in traps built of stones.

"During each of the following winters, their tracks were occasionally seen, and at Victoria Harbour they were very numerous."[21]

Sverdrup says: "There is still, perhaps, another animal of prey to be found in these tracts, the Glutton (*Gulo luscus*). It is a more southerly and westerly form, and its tracks, or the animal itself, were not with certainty observed east of Crown Prince Gustav Sea"[22]; that is, lat. 80°, long. 95°.

"Its bones have been found in Melville Island, nearly in latitude 75°."[23]

Lyon, writing from Winter Island, lat. 66°, 11′, long. 83° W., says: "The *Kablee-a-ghio*, which I suppose to be the Wolverine, is also found in the mountains; the Esquimaux esteem it good eating."[24]

"Toolooak, who was about 17 years of age, had never seen either the Muskox or the *Kablee-arioo* [Wolverine], a proof that the latter, also, is not common in this corner of America [Repulse Bay]."[25]

"The skull of a Woolverene without the lower jaw, was picked up in Melville Island, but the living animal was not met with."[26]

Major L. T. Burwash, of the Wild Life Department, Ottawa, tells me that a Wolverine was caught at Cumberland Sound, southeast coast of

[20] Nelson, Alaska, p. 249.

[21] App. to Ross's Second Voyage, 1835, pp. viii–ix.

[22] New Land, II, App. III, p. 479. E. Bay.

[23] F. B. A., I, p. 44.

[24] Private Journal, 1824, p. 127.

[25] Parry's Second Voyage, 1824, p. 512.

[26] Parry's First Voyage, Suppl. to App. Mammalia, 1824, by Capt. Edward Sabine, p. clxxxiv.

Baffin Land, Feb., 1924. About one each year is taken on this island, chiefly in the north end. They seem to be wanderers that come north by way of Boothia.

Dr. R. M. Anderson writes me that all of Baffin Land, Victoria Land, and King William's Island, are in the range of the species.

Records in the United States

The full list of the records in the United States is before me, but its bulk prevents its use here, except in briefest form. On the map, however, each occurrence is spotted.

Those for New England are as follows: Maine (Bachman); New Hampshire (C. F. Jackson); Vermont (Zadock Thompson, Bachman); Massachusetts (Emmons, DeKay).

Those for the Northern Tier: New York (Bachman, DeKay); Pennsylvania (Rhoads); Ohio (Brayton); Indiana (Hahn); Michigan (N. A. Wood); Wisconsin (Cory); Minnesota (C. E. Johnson, H. H. T. Jackson); Black Hills, Dakota (Baird); Montana (Bailey).

Those for the Mountain States: Wyoming (Coues, Lindsley, Seton); Colorado (Allen, Warren, Coues, Seton); Utah (Stansbury, Yarrow, C. T. Barnes); New Mexico and Arizona (Coues); Idaho (Merriam).

Those for the West Coast: California (Merriam, Stephens, J. Grinnell, Dickey, Austin, Storer, Fry).

Fur, Musk, and Flesh

The name of "Skunk-bear" is not at all a bad one in describing the fur of the Wolverine. It has the size of a small Bear, somewhat of the quality of a Bear robe, and yet with the two paler bands spreading, Skunk-fashion, from the nape of the neck along the sides, to unite again in the bushy, skunk-like tail. It further rejoices in a respectable modicum of nauseating, musky smell to complete the semi-imitation. So it is quite worthy of its trapper name.

As in all Weasels, the musk is produced by the anal glands, which are well developed in the present species.

The only definite and available description of these glands is by Capt. J. C. Ross. During his Arctic trip (1829–33) with his uncle, Sir John Ross, they wintered at Victoria Harbour, at the base of Boothia Peninsula, on the east coast. A Wolverine came on deck in midwinter and was strangled. J. C. Ross comments: "By discharging the contents of two secretory organs, it emitted a most insupportable stench. These secretory vessels

are about the size of a walnut, and discharge a fluid of a yellowish-brown colour, and of the consistency of honey, by the rectum, when hard pressed by its enemies."[27]

"If a little care is used in skinning the Wolverine, and the scent glands are cut away from the body, the flesh is of good flavour, and as the Wolverine is generally in good condition, even in midwinter, we often used to eat them in preference to lean Caribou, when on a 'straight meat' diet. Even when the animal has been some time in a trap, the fur does not acquire a disagreeable smell. According to my observations, the Wolverine is clean."[28]

Primitive Numbers and Fur Trade

This species reaches its chief abundance in the Barren-grounds, between the north limit of trees and the Polar Sea. In the Hudsonian and northern half of the Canadian Fauna, it is of regular occurrence. South of this it is rare, and north of the Arctic Coast, a mere straggler.

In view of the animal's ancient range, and the trifling encroachment made on it by settlement, we may consider that it continued in primitive numbers at least until 1870.

According to the earliest available Reports of the Hudson's Bay Company (Poland's lists), during the 10 years, 1752 to 1761 inclusive, the average annual catch of Wolverine pelts was 798. Exactly 100 years later, the average annual catch was 1,206, which meant, no doubt, that the trade was more widely organized.

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 101,426 skins of this species, an average of 1,192 for each year. The lowest was 402 in 1827; the highest, 2,322 in 1879. The average for the 10 years, 1895 to 1905, was 726.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 10,596 skins were taken by the other American companies, an average of 149 for each year. So that the average annual catch of Wolverine for fur is about 1,300.

According to the Canadian Government Reports on fur taken in the Dominion, Wolverine numbered 1,694; 960; 1,143; 1,027; 908, respectively for the years 1919 to 1924.

Comparing it with other species, these figures imply that the Wolverine are about as plentiful as Badgers in Canada; compared with Blackbear, about 1 to 6; with Otter, 1 to 10; with Lynx, 1 to 14; with Fox, 1 to 18.

Although a creature of the treeless North, it is nowhere abundant.

[27] App. to Ross's Second Voyage, 1835, p. ix.

[28] R. M. Anderson, personal letter.

During his 16 years in Labrador as a fur-trader, Capt. George Cartwright, though continually trapping, records killing only 5 Wolverines (Wolverings, he calls them) and saw only one alive, although it is considered common in that region.[29]

Dr. R. M. Anderson, who knows the Wolverine in its home region, i.e., the Arctic Coast of Canada, says: "To illustrate the elusive habits of the Wolverine, I find that I have seen just 16 living, free Wolverines in my field experience. I have seen such myriads of tracks in different places, and so many evidences of their works, that it seems strange that the animal is not more often visible."[30]

At the London annual fur sales, held at Lampson's, March, 1906, the highest price realized was 34 shillings ($8.16) each for 64 first-class dark skins, from which they graded down to 7 shillings ($1.68) for third-class skins.

The average value of all pelts, prime and poor, taken in Canada during the fur boom of 1920, was $21.01. The choicest skins went as high as $30. Since then, the price has fallen to $10 or $15.

Numbers To-day

In the Far North, its centre of abundance, the Wolverine population is probably but little changed in the last hundred years. Warburton Pike says: "It is an animal common enough in many parts of Canada, but is rarely seen in the woods on account of its retiring habits. In the Barren Ground, however, I had many opportunities of watching them through the glasses, as they worked at the carcass of a Caribou or Musk-ox, and was much struck by the enormous power exercised by so small an animal; in travelling, it seems to use only one pace, the *lope* of the Western prairies, which it is said to be able to keep up for an indefinite time."[31]

R. M. Anderson says: "In the region centring about Great Bear Lake, there has been little hunting, and the Wolverine is more plentiful than any other predatory animal, but Arctic Fox and Wolf. . . . In the Dease River region, they are very abundant. They have a habit of following a man's tracks whenever they run across them, knowing that a man's trail usually has a 'grub pile' at one end or the other. They are so common here that any one, following his own trail the next day, usually finds a Wolverine's track on it."[32]

[29] Sixteen Years, various pages.

[30] Personal letter.

[31] Barren Ground of Northern Canada, 1892, p. 54.

[32] Personal letter.

In its southern extension, chiefly, it is that the Wolverine has suffered. In the Red River Valley, the region about Pembina, it was regularly found in early days, although not plentiful, as is shown by the Red River fur returns of Alexander Henry.[33] In 1800–01 and the years following, he got 5, 4, 10, 8, 17, 45, 8, 3. Now it is wholly extinct in that region.

In California, according to Walter Fry: "It is becoming very rare. Wolverine are most abundant in the vicinity of Mount Whitney and Sequoia National Park. . . . The last capture was at Mineral King, during the winter of 1921-22. Three animals were taken. . . . This catch practically wiped out the species in the Mineral King district, for the tracks of but one animal have since been observed in that vicinity."[34]

Joseph Dixon records the catch of Wolverines in California, 1920 to 1924 inclusive, as 2, 2, 1, 3, 0; and forecasts the early extinction of the species unless protective measures are at once taken.[35]

Haunts and Home Range

Dense forests, broken rocky hillsides and open tundras, are much to the liking of this free-roving bandit, provided only these places be not so wet as to be swamp, so dry as to be desert, or so warm as to be less than Canadian in average temperature. He must have a snowland in the winter. Yet one more essential he insists on—that is, good hunting—game big or small, enough in quantity in the depth of winter to guarantee to his tireless assiduity, at least one square meal a week. Four meals a month, with frost and snow galore, is all he asks; and plays a sportsman's game. He plays it with success, too, for, so far, every Wolverine recorded has been fat and well-favoured.

But Carcajou is a wide ranger. Not a little scrap of ground he craves on this broad continent, but a European kingdom.

What little definite evidence we have is herewith given:

Dr. John Bachman tracked a Wolverine for about 5 miles over the snow-clad hills of northern New York.[36] In Labrador, Cartwright saw one which carried a heavy trap for 6 miles.[37] MacFarlane writes me of one which trailed him for 12 or 15 miles, and tells me of another which followed him a couple of days, when he was travelling 40 miles a day. The

[33] Journal pub. 1897, various pages.

[34] Wolverine, p. 130.

[35] Cal. F. & G., Jan., 1925, pp. 23–25.

[36] Q. N. A., I, p. 207.

[37] Sixteen Years, II, p. 407.

trappers generally say it will keep after them along a line of 40 or 50 miles, to steal their trap baits. Thomas Hutchins says even 60 miles.[38]

A most remarkable case is recorded by Low in his Labrador experiences:

"In the fall of 1893, a Wolverine carried away a trap from the North-west River, and [still bearing the trap] was taken a few days later in another trap on the Hamilton River, some 30 miles away from the place where it had picked up the first trap."[39]

A still stronger evidence of power is supplied by R. M. Anderson, who writes me that in Feb., 1909, while he was with the Eskimo near the head of Chandelar River, north Alaska, a Wolverine went off with a steel trap on its foot. A young Eskimo, Pikelo, took up the trail, and although the weather was 18 to 20 below zero, followed the Wolverine, camping on its track for three days. During that time, he travelled some 60 miles. Finally he sighted the Wolverine, but it escaped among some rocks.

"Wolverine," says Walter Fry, "are tireless wanderers, and do most of their travelling at night, but when forced by hunger they will hunt by day. They have but little migratory impulse, and usually remain in the vicinity where born. They do not dig burrows in which to live, or for shelter and protection, as do some of their smaller brethren, but simply lie down in places at random, usually under some shelving rock or at the base of a tree."[40]

According to Charles L. Smith, the Banff, British Columbia, guide, "This animal has the widest individual range of any carnivorous animal with which he is acquainted, not even excepting the Grizzly-bear. He says that, from its home den, a Wolverine will travel from 20 to 30 miles in each direction."[41]

A large animal needs a proportionately larger range than a small one of similar food habits; a flesh-eating animal needs a much larger range than a grass-eater. Therefore, the Wolverine, being a large animal, and strictly a flesh-eater, requires a wide range, apparently as large as that of the Grizzly.

Hunters generally agree that the Wolverine is a wide ranger, covering a region of at least 50 miles across in the winter. In the summer, it need not go so far for food, and must stay in the neighbourhood of its family.

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[38] F. B. A., I, p. 43.

[39] Labrador Penin., Geol. Surv. Can., 1896, App. I, p. 315 L.

[40] The Wolverine, p. 131.

[41] Camp-fires in the Canadian Rockies, Hornaday, 1906, p. 306.

Tracks and Tread

On the Barren-grounds during the summer of 1907, I had one or two chances to see the tracks of Wolverine, and made the drawings herewith.

Grinnell and Storer, discussing the tracks of the species as seen in the Yosemite, observe:

"In several other places, as at Vogelsang Lake and Fletcher Lake, tracks were seen which, chiefly through a process of elimination, were ascribed to the Wolverine. The only other large carnivore in the high mountains is the Mountain Coyote. But the Wolverine's track is not doglike; the sole-pad on the fore foot is divided up into small units, whereas the sole-pad of the Coyote is a single unit. The Badger, which also has a relatively large track, has an elongated triangular foot-pad."[42]

In many early accounts and pictures, the Wolverine is presented as a plantigrade animal, that is, one that sets the whole foot on the ground in bear-fashion. Numerous observations on living specimens, as well as study of its trail, show that it treads on the toes only, is truly digitigrade, as are most of the Weasel family.

Mating and Den

Mating takes place about the middle or end of March. Miles Spencer is of the opinion that the Wolverine pairs, and that the male assists in rearing the young.[43]

Abe Leeds, my Idaho guide, tells me that he has seen a pair of Wolverines roaming together in autumn among the mountains of Jackson's Hole, so it is possible that the species pairs for life, though the analogy of other Weasels is against this conclusion.

The home den may be variously placed. Mostly, it is on the ground or in a cave. Sometimes, the old one digs it out, but oftentimes uses any ready-made convenient hole it can find. Hearne writes on this point:

"Mr. Graham says they make their lodgings in the clefts of rocks, or in hollow trees. The former I acknowledge, but I believe that neither Mr. Graham, nor any of the Company's servants, ever saw an instance of the latter. In fact, during all my travels in the interior parts of Hudson's Bay, I never saw a hollow tree that was capable of affording shelter to any larger animal than Martins, Jackashes [Minks], or Wejacks [Fishers]; much less, the Quiquehatch or Bear, as some have asserted."[44]

[42] Animal Life in the Yosemite, 1924, p. 86.

[43] Low, Expl. James Bay, 1888, Geol. Surv. Can., Part J, App. III, p. 77 J.

[44] Journey, p. 374.

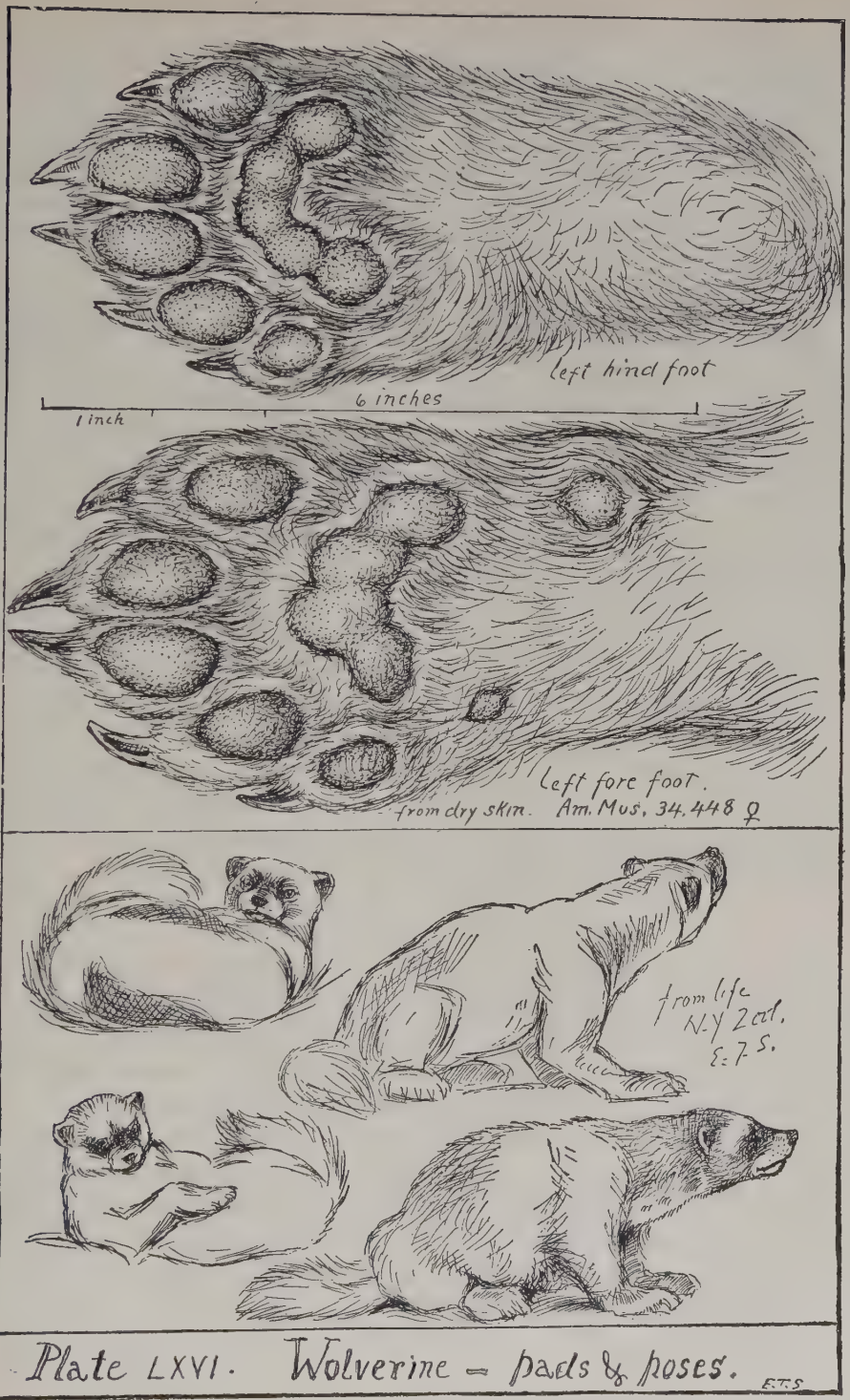

Plate LXVI. Wolverine — pads & poses. E.T.S.

MacFarlane says: "A discarded Beaver lodge serves."[45]

Concerning its dens in Sequoia Park, Fry says: "Upon two occasions, I have come upon beds in Sequoia National Park where young had been born and reared, as was plainly evidenced by the premises and surroundings. The first was found on the north spur of Mount Silliman on September 10, 1909, elevation 10,800 feet. The second was on the south side of Vandever Mountain on September 18, 1918, elevation 11,000 feet.

"In both cases, the choice for beds or dens, was under shelving rocks, and but little preparation had been made for the occasion. A round-like excavation some 6 inches in depth and 5 feet in width, with scant lining of grasses and small pieces of pine boughs, comprised the whole. The strange feature of both lairs found, was that no bones of the animals that had fallen victim of their prey, could be found, as is always the case in such instances with the Lion, Bear, Fox, Wolf, and Lynx. No doubt these had been consumed by the parent mother as food, or carried away for some distance."[46]

Two Wolverine nests, described to me by natives in the Slave River country, were hollows in the ground under the low-hanging boughs of a spruce. They were about 6 inches deep, and lined with a little dry grass.

The winter den of one, secured in Rensselaer County, N. Y., is described by Bachman, and from his account, we may form an idea of the nursery.

"There was a large nest of dried leaves in the cavern, which had evidently been a place of resort for the Wolverine. . . . during the whole winter, as its tracks from every direction led to the spot. It had laid up no winter store, and evidently depended on its nightly excursion for a supply of food. It had, however, fared well, for it was very fat."[47]

Breeding and Borning

Because mating takes place about the middle of March, and the young ones are born in June, gestation is supposed to last about 90 days. Analogy would make it at least 100; but there is no conclusive evidence. Indians and trappers report the mating season and the bearing season from two to three months apart. Doubtless, seasons vary with latitude.

Most of the Hudson's Bay Company's traders agree that the young are born in June; but in the Barren-grounds, that is, the Arctic region, they may not come till July. As will be seen later, I have evidence of the Siberian Wolverine, supposed to be identical with ours, producing young in April.

[45] Mamm. N. W. T., 1905, p. 708.

[46] The Wolverine, p. 133.

[47] Q. N. A., I, p. 209.

My guide, Bellalise, found young ones as big as a Muskrat, in mid-May. This surely points to borning in April.

The little ones number 2 or 3, rarely 4, but MacFarlane says sometimes as high as 5.[48] The very low numbers are usually the offspring of a very young, or a very old mother.

In early life, they have been little observed, because the mosquitoes are such an insufferable torment in their haunts during summer, that no man goes there except under dire compulsion. The half-breeds and Indians of the far Northwest have often assured me that the young are white at birth, but they could not produce the skin of one. I was glad, therefore, to find in the American Museum of Natural History 2 young ones taken by N. G. Buxton in northeastern Siberia, on May 7, 1901, which, judging from their size, must have been 3 or 4 weeks old. They are male and female.

The male, as measured in the dry skin, is: Length, 16½ in. (419 mm.); tail, about 3¼ in. (82 mm.); hind foot, 2⅛ in. (53 mm.).

It is clad in a dense wool which is yellowish-white tinged with brownish-gray, on crown, legs, back, under parts, and tail; the face bears a mask of brown. Thus it has all the adult marking expressed in very faint colours.

The female is precisely similar.

The Mother and the Family

On one point all my Indian friends and all the books are agreed—that it is as safe to enter the den of a mother Bear as to face a Wolverine when she is with her young. She is a tigress of ferocity, absolutely fearless, and so strong and quick that a man, even armed with a gun, is taking risks if he come near. A mother Bear *may* attack you; a mother Wolverine *certainly will.*

"Bellalise, a half-breed Chipewyan, told me that twice he had found Wolverine dens and been seriously endangered by the mother. The first was in mid-May, 1904, near Fond du Lac, north side of Lake Athabaska. He went out with an Indian to bring in a skiff, left some miles off on the shore. He had no gun, and was surprised by coming on an old Wolverine in a slight hollow under the boughs of a green spruce. She rushed at him, showing all her teeth, her eyes shining blue, and uttering sounds like those of a Bear. The Indian boy hit her once with a stick, then swung himself out of danger up a tree. Bellalise ran off after getting sight of the young ones; they were four in number, about the size of a Muskrat, and pure white. Their eyes were open. The nest was just such as a Dog might make, only

[48]Mamm., N. W. T., p. 708.

6 inches deep and lined with a little dry grass. Scattered around were bones and fur, chiefly of Rabbits.

"The second occasion was in 1905, within 3 miles of Chipewyan, and, as before, about the middle of May. The nest was much like the first one; the mother saw him coming and charged furiously, uttering a sort of coughing. He shot her dead; then captured the young and examined the nest; there were three young this time. They were white like the others."[49]

As soon as the young are able to leave the nest—that is, in late summer—they rove about with the mother. She is a resolute, wise, tireless, and loving guardian. Their family life is nearly ideal. I say "nearly" ideal, for, so far as I can learn, the father does not assist in rearing the young. The mother bears her burden and tastes her joys alone. True, MacFarlane says: "The male is supposed to render some assistance in rearing the young,"[50] but he does not speak with the authority of an eyewitness.

The young are suckled for 8 or 9 weeks, and fed at home by their mother till quite late in summer. D. T. Hanbury says that, August 13th, on the Dease River, near Great Bear Lake, he "shot a female Wolverine as she was swimming across the river. She carried a Ground-squirrel in her mouth, which she evidently had intended for her family."[51]

"In October, when the rivers set fast, the Wolverines reappear in families, the young still following their dam, though now not much her inferior in size. They are full grown when about a year old."[52]

But one brood is produced in a year.

Food

The food of the Wolverine is, I doubt not, carbo-hydrates, proteins, glutens, vitamines, etc. But he does not approach them in that way. All substances in his world are by him divided into two lists—food and rubbish. The only chemical laboratory that he relies on for guidance in this discrimination, is his nose. If the new substance gives off an aroma that pleasantly stimulates the broad and convoluted mucous membrane of his anterior nares, that is enough: it is food. If it doesn't, it isn't.

With his perfect equipment of senses and powers to find, approve, and take, and with his broad views on diet, the Wolverine has no difficulty in living high all summer long. And, strange to tell, the favourite and abundant foods are flesh-providers smaller than himself—Woodchucks, Ground-

[49] Arctic Prairies, by E. T. Seton, 1911, pp. 253–54.

[50] Mamm. N. W. T., p. 708.

[51] Northland of Canada, 1904, p. 232.

[52] Lockhart letters, in Coues's Fur-bearing Animals, p. 52.

squirrels, fish, frogs, Rats, Mice, birds' eggs, birds, and Squirrels when he can get them. His success as a food-finder is so complete and unbroken that Samuel Hearne says:

"They are very slow in the pace, but their wonderful sagacity, strength, and acute scent make ample amends for that defect; for they are seldom killed at any season when they do not prove very fat: a great proof of their being excellent providers."[53]

In ancient books, the Wolverine is credited with being the inveterate enemy of the Beaver and the Reindeer. One might reasonably infer, from two favourite and precious pictures of fifty years ago, that these two and none other were its habitual and limited diet. All the evidence I can gather, and it is much, goes to show that, while it can climb and swim, it is not much at home in the trees or in the water. In other words, both Deer and Beaver are usually safe from its attacks.

Richardson says: it "feeds chiefly upon the carcasses of beasts that have been killed by accident. . . . It feeds also on Meadow-mice, Marmots, and other rodentia, and occasionally on disabled quadrupeds of a larger size."[54]

Coues, condensing many accounts, says they will devour "anything they can catch or steal. Their own flesh is eatable only in the extreme of starvation."[55] But he does not make it clear whether it is the hunter or the Wolverine that must be starving before it will eat Wolverine meat. As already noted, Hanbury records the species feeding on Ground-squirrels.

The more light we have on the habits of the Wolverine, the more its living prey diminishes in size, and I doubt not that continued investigation will dwindle its main support into Ground-squirrels, Mice, and Lemmings, with even these taking second place in its affections, to carrion or stolen meat.

In late summer, he often feasts on berries. "If meat is not to be had, they will eat berries freely."[56] I have not yet heard of the Wolverine feeding on nuts, roots, or grass.

A Killer of Small Deer

"His principal food in the Sierra Nevada," says Fry, "consists of the Yellow-bellied Marmots, carrion, Gophers, Rats, and Mice, with occasional sick or crippled wild animals which he is able to drag down. With his long

[53] Journey, p. 372.

[54] F. B. A., I, p. 43.

[55] Fur-bearing, p. 52.

[56] Warburton Pike, Barren Ground, p. 53.

claws and great strength, he can dig very rapidly, and catch many of the smaller rodents in their burrows."[57]

But this is summer fare, when he has choice of a long and easy list of foods. The short bright autumn of his range is followed by the fierce and early winter. The frozen earth seals in, or puts to sleep, all the minor contributors to his diet. The birds have been driven away by storms, and the Wolverine, unlike his big rival the Bear, has not the chance of a long forgetfulness in winter-sleep. Nor does he unite with others of his kind to make a pack ensemble. True to his lone scout creed, he faces the hard, drear fight alone. Winter, famine, and trapper, he accepts as necessary ills, mere obstacles in his pathway through the world that owes the King a living.

Rabbits are, no doubt, the Wolverine's winter main-stay in the dread white North. Warburton Pike says:

"They follow the herds [of Caribou] more for the pickings they can get from the feasts of the Wolves, and are content with showing their fighting powers on Hares and ptarmigan."[58]

Keewaharkess's Hunting

How the slow, lumbering Wolverine can catch the swift Hare is not very clear. Richardson mentions that "I have seen one chasing an American Hare, which was at the same time harassed by a snowy owl."[59] It looks like a partnership affair, a combine of router-out and runner-down, although it was probably an accidental coöperation of two bitter enemies and rivals.

It is more than likely that the Wolverine, with his tireless strength and pertinacity, runs down the Hare in long, persistent chasing. For the swift one is not the winner in such events, but the stout-hearted. The Wolverine knows he will win, the Hare fears he will lose—is so sure that he will lose that the paralysis of terror sets in, and he is lost.

How the Wolverine captures ptarmigan is an entirely unwritten chapter. I suspect that he manages by crawling up to them as they sleep in a snowdrift.

W. Fry contributes a painfully suggestive paragraph, intimating that, when hard pushed, the Wolverine will kill and eat Porcupine. He says: "The Sierra Nevada Wolverine (*Gulo luscus*), is making his last stand. . . and is making a losing fight. Man is an enemy who seeks to kill the Wolverine at every opportunity; while the Porcupine, when captured as food

[57] The Wolverine, p. 131.

[58] Barren Ground, p. 53.

[59] F. B. A., I, p. 43.

by the Wolverine, proves a fatal meal, his sharp quills puncturing the Wolverine's intestines, and causing painful death within from 7 to 10 days."[60]

Listing his prey in order of importance, we find that the Fox is a mainstay in some regions. Hearne says: "They commit vast depredations on the Foxes during the Summer, while the young ones are small; their quick scent directs them to their dens, and if the entrance be too small, their strength enables them to widen it, and go in and kill the mother and all her cubs. In fact, they are the most destructive animals in this country."[61]

Still larger and more acceptable, but less often secured, is the Beaver. "These animals," says Hearne, "are great enemies to the Beaver, but the manner of life of the latter prevents them from falling into their clutches so frequently as many other animals."[62]

In 1784, Pennant, citing Dobbs, says of the Wolverine: "It is a great enemy to the Beaver, and is on that account sometimes called the *Beaver-eater*."[63]

Nevertheless, leaving out Mayne Reid, the joy-maker of our boyhood, we have at least one good witness to evidence the Beaver-killing record of this brave hunter. General D. S. Stanley, writing from Fort Sully, Dak., (on the east bank of the Missouri River, 10 miles above the mouth of the Cheyenne River near the town of Fielder) says: "The Wolverine follows the Beaver and preys upon them; in Northern latitudes, the Wolverine is almost always present where the Beaver is abundant. The Beaver has a beaten path on the bank of the stream near his lodge. There the Wolverine lies in wait for him, and often cuts short his career."[64]

It must be remembered also that, during 7 or 8 months of the year, the Beaver is out of the water much of the time—nearly every night indeed—cutting wood, working on its dam, digging canals. During the daytime, it comes out occasionally to enjoy a sun bath, or to have the ants pick the fur-lice from its coat. In the winter, the story is different. The Beaver then is safe under the ice—that is, normally; but Nelson says that in Alaska "I was assured by a fur trader who passed many years on the Kuskoquim that, during very severe winters, when the ponds freeze so that the Beavers are confined to a narrow space about their houses, the Wolverines sometimes dig through the roofs of the Beavers' houses and kill the inmates."[65]

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[60] The Wolverine, p. 129.

[61] Journey, p. 374.

[62] As above, p. 374.

[63] Arc. Zool., I, p. 68.

[64] Am. Nat., 1868, p. 215.

[65] Alaska, p. 259.

The half-breed, John Hunter, told DeKay that he had known the Wolverine "to be domesticated and employed by the Indians to catch Beaver."[66]

Between the Wolverine and the Wolf, there seems to be some sort of armed neutrality, for there is no record of a clash, though often they must meet in the Barren-grounds, where both are found in numbers. Their community of interest is implied by Warburton Pike, who, discoursing on the Caribou, says:

"There are the ever-hungry Wolves and Wolverines that hang with such pertinacity on the travelling herds, and rely upon them entirely for subsistence."[67]

During my journey to the Barren-grounds in 1907, I camped at Last Woods, Artillery Lake, Sept. 6th. The day before, one of my men had killed a Caribou, and found, on coming back, that a Wolverine and 2 cubs had carried off a large part of it. I did not see the animals, but the signs were everywhere clear. This was the only time when I personally contacted the species in a wild state.

The Common Deer and the Wolverine are rarely found in the same region, so that his supply of venison is from the Caribou.

The old story, accepted and repeated, if not invented, by Pennant, was that the Wolverine habitually crouched in some high tree, waiting for a Caribou to pass beneath, whereupon he leaped upon its back, cut its throat, rode it to death, and feasted to repletion. This story, once accepted, was so unlikely, in view of the creature's known habits, that a period of utter skepticism followed, and the story was declared a preposterous myth. It was even denied by Dr. E. Coues that a Wolverine could climb a tree.[68]

Pike, knowing that the Wolverine rarely climbs, and further, that there were no trees in the land where these two animals most abounded, wrote: "I scarcely credit the statement I have often heard made, that the Wolverines will kill a full-grown Caribou, although it is possible that they may attack the young ones."[69]

We have, however, been too hasty in utterly dismissing the old account as fabulous. The following is all the positive evidence at hand:

As Caribou Killer

Martin Hunter, an old Hudson Bay trader from 1863 to 1903, out of his abundant experiences, sends us the following remarkable confirmation

[66]Nat. Hist., N. Y., 1842, p. 28.

[67]Barren Ground, p. 52.

[68]Fur-bearing, p. 45.

[69]Barren Ground, p. 53.

of a story that has been through the various stages of fame, doubt, and discredit. He was watching for Beaver at a lake when a crashing of underbrush was heard.

"A few moments after, we saw a large Caribou break cover, about 100 yards to the right, and spring into the lake; but what was that black object clinging to his neck? Surely some animal!

"The Caribou struck out as fast as it could swim, heading for the farther shore, and we jumped into our canoe and gave pursuit. The keen eye of the animal on the Caribou's neck having detected us, it relinquished its hold, dropped off into the water, and turned for the shore the Caribou had left.

"The canoe was immediately headed to cut off his retreat, and when within proper distance, I shot it with one barrel, and left it there dead on the surface of the lake, while we continued our chase.

"This diversion had taken our attention from the Caribou, but now, when we had resumed the chase, we found the animal was getting through the water very slowly, and as we were paddling in its wake, we perceived the water at each side of the canoe was bloody. By the time we reached the Caribou, it was dead.

"On examination, we found the jugular vein had been cut by the fierce animal on its back, and it had bled to death, fleeing with what strength it had, to the last drop of the poor thing's blood.

"We threw a string over its horns, and towed it back to the portage, picking up, in passing, our floating black animal, which proved to be a very large Wolverine, Carcajo, or Indian Devil."[70]

Kills a Moose

As we shall see, the Wolverine is ready to attack the Bear if it dares dispute his ownership of a prey. This does not imply that the Wolverine can kill and eat a Bear, but it prepares us to accept more readily the following account, given me by the Chipewyan Indians.

In the summer of 1907, when I was at Smith's Landing, on the Great Slave River, Alta., I was assured by Joseph Hoole, the interpreter there, that he had seen the tracks of a Wolverine following the tracks of a Moose 60 miles west of the Landing. The Indians say that Wolverine will kill Moose, following them persistently till they begin to run in circles, and go sort of crazy, when they are easily killed.

This surprising statement was to receive unexpected verification within a year. The late J. Keele, one of the trained observers of the Geological

[70] Canadian Wilds, 1907, pp. 150–51.

Survey of Canada, is responsible for the following record. It shows that Keewaharkess will at times match weapons with Mooswa.

During the winter of 1907–08, he was exploring on the headwaters of the Yukon, with R. B. Riddell and J. M. Christie, old-timers of the region. On the 27th of March, they found a wounded 3-year-old bull Moose, helpless, in the deep snow. They shot him; then found a large hole torn into the backbone, while patches of Moose hair were scattered about. The tracks showed that this Moose had had a long and running fight with a Wolverine.

"After a thorough examination, Christie came to the conclusion that there was only one Moose and one Wolverine concerned, and that we had interrupted a tragedy which is unique in the annals of the far North country. . . .

"The Wolverine would have killed the Moose in a very short time if we had not driven him off, and it was fortunate for us that we supplanted him, as our supply of dried meat was almost exhausted."[71] They saw the Wolverine, but failed to get him.

Does He Store Food?

Creatures which brave the Arctic winter have usually a special device for solving the problem of famine. Either they move out—that is, they emigrate—or store food far in advance, or grow enormously fat in the autumn and live on their own fat. So far as known, the Wolverine does none of these, but bravely faces and fights King Jack Frost, with absolute reliance on his own rare gifts as a hunter. And the results seem to justify his venture, for never yet has any one recorded a Wolverine taken in a starving condition. No matter how severe the season or deep the snow, at the end of the Hunger Moon the Wolverine appears fat and well-favoured as ever.

Why Called Glutton

It was inevitable that a creature of such remarkable personality as the Wolverine should impress itself on the imagination of all who volunteered to be its biographer. The love of the marvellous, and the exaggerated idea of animalism expressed in the shocking word "bestiality," resulted in such amazing tales as those of Olaus Magnus; tales built up, no doubt, on some actual observation, but recorded at twentieth hand, after being continually developed and improved by each one of the twenty excited imaginations through which the picture passed.

Here is one example that will answer for all: "It is wont, when it has

[71] Forest & Stream, Dec. 19, 1908, p. 971.

found the carcass of some large beast, to eat until its belly is distended like a drum, when it rids itself of its load by squeezing its body betwixt two trees growing near together, and again returning to its repast, soon requires to have recourse to the same means of relief."[72]

What delightful simplicity! What an uncomplicated interior! One strangely smooth tube! What a pleasant cathartic! What a picturesque purgation! How happily did it come about that the carcass of the beast was so handily placed by trees just rightly spaced!

Now for the slim ledge of fact on which this towering, tottering structure has been built. Walter Fry writes:

"Because of his voracious appetite, the animal is often called the 'Glutton.' This seems appropriate, for not elsewhere in North America do I know of a mammal in proportion to its size with such capacity for coarse food at one given time, or which has such powerful organs for the digestion as those of the Wolverine."[73]

There is, however, some positive testimony that the creature is not specially gluttonous. "The Edwards Brothers, animal showmen, have to-day a captive Wolverine which they have kept for 12 years, and its daily ration of meat is only half a pound."[74]

In view, then, of its size, its tireless activity, and its winter need of making a long, lasting meal when the rare chance arrives, there can be no doubt, I think, that the Wolverine's appetite for food is no greater in proportion than that of any other vigorous creature to which Dame Nature owes a living, and is willing to balance the debt only on condition of perpetual application to the problem.

Can He Climb?

In the wave of incredulity that overwhelmed all the thrilling tales of which the Wolverine was hero, the notion that it climbs a tree, was washed away. E. Coues definitely states it "does not climb trees like most of its allies."[75]

Now we experience the reaction.

During my Northern Journey on the trail of Sir George Back, I was warned of the danger of starvation; so prepared, as I went in, by leaving, every hundred miles, a cache with enough food in it to carry me 200 miles. First I secured it from Dogs, Wolves, Foxes, etc., by placing it 15 feet up

[72]Olaus Magnus, Gent. Septen., p. 138, quoted in F. B. A., I, p. 42.

[73]The Wolverine, p. 131.

[74]W. T. Hornaday, Camp-fires in Can. Rockies, 1906, p. 308.

[75]Fur-bearing, p. 45.

in a tree. The Indians are too honest to touch a cache; there were no white men. The weather I offset by a tarpaulin covering; the ravens, by flashy tins hung on strings. But the hardest to guard against was the Wolverine How was he to be kept away?

Taking a hint from J. W. Tyrrell, I cut from the selected trees all branches that would make climbing easy. I smoothed the trunks then, finished by nailing on to each a necklace of cod hooks with points directed downward. When we came back weeks later, our caches were intact. The cod hooks were bent in places, and had brown hairs in them. Evidently, then, the Wolverine can climb, and equally sure it is that one, at least, tried but failed, thanks to the hooks, to climb my trees.

Reference to the section "Baffling the Carcajou," shows that the Indians assume the creature to be more or less arboreal.

Walter Fry thus discusses the question: "Do Wolverines climb trees? To this I would say that never have I seen Wolverines climb trees, but I have a verified record of such.

"The occurrence took place during the month of May, 1903, at Mineral King, Calif. Two forest rangers, Clarence W. Fry, Three Rivers, Calif., and William A. Hindman, Visalia, Calif., came suddenly upon a Wolverine that climbed trees, and without hesitation. The animal, when first routed from its lair, gave a few jumps, climbed up a large fir tree some 30 feet, then backed to the ground quickly. When the animal reached the ground, upon being pursued closely by both men and a Dog, it climbed up a second large fir tree a distance of some 60 feet, at which point it was shot and killed by Ranger Fry."[76]

Norman A. Wood, of Ann Arbor, Mich., adds concerning "the ability of the Wolverine to climb trees, I would like to call attention to a photograph of one in a tree, which was published in the *National Geographic Magazine*, Vol. 29, May, 1908, p. 353. The picture was taken in October, 1907, in Big Horn County, Wyoming, by Alan D. Wilson, who says: 'The photo is, I think, almost unique, for they are not only rare, but generally prefer to go over the rim-rock than tree when chased.'"[77]

Finally, be it remembered, in the Wolverine's attack on the Moose, already set forth, Keele says: "He climbed several trees, hoping the Moose would pass under him, and he finally succeeded in dropping on the animal's back."

Are we not now practically back to Pennant's account, so long scouted as a fabulous tale? He says: "By a wonderful sagacity, it will ascend a tree,

[76] The Wolverine, p. 133.

[77] Journ. Mamm., Nov., 1921, p. 234.

PLATE LXV.—WOLVERINE
Drawing loaned by New York Zoölogical Society

PLATE LXVII.—WOLVERINE AND CUBS

and fling from the boughs a species of moss which Elks and Reins are very fond of; and when those animals come beneath to feed on it, will fall on them and destroy them: or, like the Lynx, it ascends to the boughs of trees, and falls on the Deer which casually pass beneath, and adheres till they fall down with fatigue."[78]

Of this statement, every item but one is now sustained by other witnesses, the exception being that of the deliberate baiting with choice mosses. The moss was, no doubt, thrown down; but who can say that it was done deliberately?

Neither Sociable nor Gregarious

The Wolverine has apparently no social instincts. No one has ever recorded seeing a band of Wolverines, or a group of more than the immature family, indulging together in any pursuit other than eating.

If it uses its musk glands for getting and giving the news, we have no observations pointing to the same.

Its only vocal effort seems to be a savage growl. Fry says: "In all my mountain experience, I have never yet heard a Wolverine, when captured or otherwise, give voice to anything but a coarse, guttural growl. Perhaps, through long experience, they know the value of silence, and prefer to keep secret their general whereabouts."[79]

Idiosyncrasies of an Indian Devil

When Linnæus called this animal *luscus*, or "half-blind," he either knew the creature very well, or stumbled on a truth; for the Wolverine has notoriously bad eyesight.

Coues thus comments: "It is said that if one only stands still, even in full view of an approaching Carcajou, he will come within 50 or 60 yards, provided he be to windward, before he takes the alarm. Even then, if he be not warned by sense of smell, he seems in doubt, and will gaze earnestly several times before he finally concludes to take himself off.

"On these and similar occasions, he has a singular habit, one not shared, so far as I am aware, by any other beast whatever. He sits on his haunches, and shades his eyes with one of his fore paws, just as a human being would do in scrutinizing a dim or distant object."[80]

"Lockhart writes that he has been twice eyewitness of this curious habit

[78] Arctic Zool., 1784, I, p. 68.

[79] The Wolverine, p. 134.

[80] Fur-bearing, p. 56.

of the Wolverine. Once, as he was drifting down stream in a small canoe, he came within a short distance of one of the animals on the bank; it stopped on perceiving him, squatted on its haunches, and peered earnestly at the advancing boat, holding one fore paw over its eyes, in the manner described. Not seeming to take alarm, it proceeded on a few paces, and then stopped to repeat the performance, when Lockhart, now sufficiently near, fired and killed the beast.

"On another occasion, when the same gentleman was crossing the Rocky Mountains, a Wolverine, which had become alarmed and was making off, stopped frequently and put up his paw in the same manner, in order to see more clearly the nature of that which had disturbed him."[81]

Bachman remarks of a captive European Wolverine that he observed in Denmark: "He was somewhat averse to the light of the sun, keeping his eyes half closed when exposed to the rays."[82]

Thus, all evidence seems to show that the Wolverine of the North is troubled with eyes that suffer in a dazzling light.

Snow-blindness is a widespread complaint among the human dwellers of these white wastes, in spite of their various contrivances to prevent it. I have often wondered how the animals escape, especially those that travel by day. Proof that they do not always get off easily is found in the following by Mrs. Mary Austin. In describing the terrors of a great snow on the High Sierra, she adds: "Even the Deer make slow going in the deep, fresh snow, and once we found a Wolverine going blind and feebly in the white glare."[83]

In the Grizzly-bear Life will be found testimony that Bears too may suffer from the frightful glare of sun on the unbroken expanse of snow.

Speed and Pertinacity

Though bear like in gait and clumsy in build, this animal is neither slow nor sluggish. A captive Wolverine which I watched in the London Zoo, went all day long at a steady lumbering gallop up and down its cage. With head low, and back high-arched, it kept on loping up and down the enclosure. It gave an impression of considerable speed and of endless endurance.

That it is not swift enough to escape on foot from mankind, is evidenced by the following adventure related by J. W. Tyrrell in his book on the Barren-grounds:

[81] Fur-bearing, p. 56.

[82] Q. N. A., I, p. 207.

[83] Land of Little Rain, 1904, p. 257.

Tobaunt Lake, Aug. 12, 1893. They sighted a Wolverine on the plain below them, and, armed only with a revolver, the young men went after it. François "started down the steep hill at a breakneck pace, followed by John, in a bee-line for the Wolverine.

"No sagacious Indian cunning, of which we so often read, was brought to play in the hunt. It was merely a question of which could run the faster and keep it up the longer. The Wolverine is not a swift animal, nature having provided him with only short limbs, but on this occasion, he used such as he had to the very best possible advantage, and with a rolling gait, made his way off across the rough stony plains at a record-breaking pace. His pursuers were, however, soon observed to be gaining on him, and as the distance between the runners gradually lessened, the race became exciting, even to me, looking on from the hilltop.

"Once or twice, in their wild chase, the men had bad tumbles, but recovering themselves, continued to gain on the Wolverine, until they had almost overhauled him. Then 'bang' went the revolver, and the Glutton, unhurt, dodging around some rocks, was almost run upon by François, who in his excitement fired again, and at the same time took a header. It appeared as if he had shot himself instead of the Wolverine, but he had done neither; he had only experienced another bad tumble on the rough, rocky ground. Gathering himself up again, François followed in hot pursuit, making a most determined chase, but just as he was about to do the tragic act, Mr. Wolverine disappeared among the broken rocks, and could not any more be found."[84]

What Does He Do When——?

What does he do when he meets a Bear? As we shall see, he assumes the master rôle, and bids the Bear "Be off!" with such a voice and aspect of authority, that commonly the Bear obeys.

What does he do when he meets a Wolf? As we shall see later, Hearne says that the Wolverine asserts his sovereignty, and, for some unknown reason, the Wolf gives way.

R. M. Anderson writes me: "The Wolverine is too tough a fighter for any sensible Wolf to tackle. If a pack of hungry Wolves got after a Wolverine, he would probably climb a tree or crawl in a rock pile."

What does he do when he meets a Skunk? So far, no one has reported on such a meeting of the irresistible and the immutable.

What does he do when he meets a Porcupine? Alas, there is a tragic

[84] Subarctics of Canada, 1897, pp. 99–100.

chapter in the answer. As we have already seen in "Keewaharkess's Hunting," he sometimes, probably not often, yields to temptation, makes a meal of the Quilly One, and, a week or two later, pays the penalty with his life. These individuals surely are the foolish ones. If the case were usual, the species would long ago have perished.

What does he do when he meets a man? If it be a family Wolverine, as we have already seen, his (or rather her) usual impulse is to close in for a finish fight; and the man, unless well armed, is in a parlous predicament, with grievous bodily hurt assured him. At other times, that is, when an unattached old one meets a man, his behaviour varies to the upsetting of all rules.

Captain Ross, when wintering at Victoria Harbour, southeast corner of Boothia Peninsula, had a curious visit from a Wolverine. He says: "In the middle of the winter, two or three months before we abandoned the ship, we were one day surprised by a visit from one which, pressed hard by hunger, had climbed the snow wall that surrounded our vessel and came boldly on deck, where our crew were walking for exercise. Undismayed at the presence of 12 or 14 men, he seized upon a canister which had some meat in it, and was in so ravenous a state that, whilst busily engaged at his feast, he suffered me to pass a noose over his head, by which he was immediately secured and strangled."[85]

Walter Fry's recent contribution on this point is refreshing. He says: "The tradition that Wolverine are ready to attack any human being gives the impression of a very dangerous animal; but I regard it as pure fiction. On two occasions have I come upon Wolverine alone, in the daytime, in their natural haunts in the Sequoia National Park, where they had probably never before been disturbed by man. Neither time did they show any signs of combat. From the actions of these two animals, I base my belief that the Wolverine will, under any ordinary circumstances, give way to the presence of man.

"It was on the morning of August 31, 1905, that I came upon my first Wolverine . . . at the eastern edge of Giant Forest on the Alta trail, elevation 7,500 feet. The animal was a very large one, and was busily engaged in an effort to dig a 'Ground Hog.' . . . Not until I had approached within less than 40 feet did he notice my presence; and when he saw me . . . it gave him a great shock. . . . He immediately sprang upon a large fir log at the butt of which I was standing, and turned facing me, gave a coarse, guttural growl, and showed his teeth. . . .

"After remaining in this statuesque attitude for some 5 minutes, the

[85] App. to Ross's Second Voyage, 1835, p. ix.

beast advanced slowly on the log toward me, and looked me direct in the face. When he had approached within about 15 feet, he suddenly stopped. . . . He stood for a few seconds, scrutinizing me from head to foot, then began to retreat by walking backwards on the log whence he came, for a distance of some 30 feet, sprang to the ground, and departed in the forest. I followed.

. . . . . .

"On three different occasions, I stamped my feet rapidly on the ground as if in running pursuit, and on each occasion, he would immediately right-about-face, and advance a few steps toward me.

. . . . . .

"The second Wolverine I met was on the afternoon of July 30, 1906, at Buck Canyon, 7 miles east of Giant Forest, elevation 7,800 feet. This was the same animal to which I have referred as having driven 2 Bears away from a carcass. Two men and myself in hiding some 150 feet away watched this affair without any of the animals detecting our presence. . . . After watching the animal for some 5 minutes, pistol in hand, I stepped out in plain sight, and advanced slowly toward him. The Wolverine looked up at me, gave a coarse growl, grabbed a large bone in his mouth, then walked slowly into the depths of a dense cherry thicket."[86]

His Strength

Hearne, of the famous Journey, writes: "As a proof of their amazing strength, there was one at Churchill some years since, that overset the greatest part of a large pile of wood (containing a whole Winter's firing, that measured upward of 70 yards round) to get at some provisions that had been hid there by the Company's servants when going to the Factory to spend the Christmas holidays." A Hudson Bay woodpile consists of whole trees set on end in a conical pile. The top may be 30 feet from the ground. These trees are chiefly driftwood, and continue to dry out as long as piled in this shape.

Hearne continues: "The people, knowing the mischievous disposition of those animals, took (as they thought) the most effectual method to secure the remains of their provisions, which they did not choose to carry home, and accordingly tied it up in bundles and placed it on the top of the wood-pile (about 2 miles from their tent) . . . but, to their great surprise, when they returned to their tent after the holidays, they found the

[86] The Wolverine, pp. 132–33.

pile of wood in the state already mentioned, though some of the trees that composed it were as much as two men could carry. . . . The bags of flour, oat-meal, and peas, though of no use to him, he tore all to pieces, and scattered the contents about on the snow; but every bit of animal food, consisting of beef, pork, bacon, venison, salt geese, partridges, etc., to a considerable amount, he carried away."[87]

In like vein, writes Richardson, after several winters in the realm of Keewaharkess: "The Wolverine," he says, "is extremely wary, and shows extraordinary sagacity and perseverance in accomplishing its ends. The Indians believe that it is inspired with the Spirit of Mischief, and endowed with preternatural powers. Though more destructive to their hordes of provisions than the Wolf, or even the Bear, and able to penetrate fences that resist their powerful efforts, it is only about 30 inches long, a foot high at the shoulder, and one foot six inches at the rump, but it is very compactly made. With teeth that do not seem to be peculiarly fitted for cutting wood, it will sever a log equal to a man's thigh in thickness, by constant gnawing. In selecting the spot it intends to breach, it shows as much skill as the Beaver generally contriving to cut a log near one end, so that it may fall down into some void space, and thus open an entrance into the hoard. The animal works so hard in carrying on this operation that it causes its mouth to bleed, as the ends of the logs and the snow often testify."[88]

R. M. Anderson adds that the Wolverine can move a rock as heavy as a man can roll, as well as handle logs that a man can scarcely lift.

His Courage—The King

Nor is his courage less than his strength. Although he usually avoids man, the hunters generally testify that he can, on occasion, face them very bravely, and rarely flies from any foe on four legs.

Such is the opinion of Hearne, who, with convincing reserve, says:

"With respect to the fierceness of these animals which some assert, I can say little, but I know them to be beasts of great courage and resolution, for I once saw one of them take possession of a Deer that an Indian had killed, and, though the Indian advanced within 20 yards, he would not relinquish his claim to it, but suffered himself to be shot standing on the Deer. . . . The Wolverines have also frequently been seen to take a Deer from a Wolf before the latter had time to begin his repast after killing it. Indeed, their amazing strength, and the length and sharpness of their claws, render

[87] Journey, pp. 373–74.

[88] Arc. Search Exp., 1851, II, pp. 84–86.

them capable of making a strong resistance against any other animal in those parts, the Bear not excepted."[89]

One of my mountaineer friends, Abe Leeds, of Idaho, gives me a stirring account of a meeting between two Wolverines and a Cinnamon Bear, over a dead Elk. All three had been feeding there for some days. But the Bear came once when both Wolverines were in possession. Leeds was waiting for the Bear, but the Wolverines attacked the new guests with great fury, and, although the battle was little more than snarling and heavy growling—"terrible coarse for so little a beast"—the Bear went off and left them in possession. Two Wolverines of 25 pounds each—a Bear that maybe weighed 500!

Dr. R. M. Anderson writes me that at noon, April 17, 1911, when camped about 50 miles east of Coppermine River on the Arctic coast, they saw a Wolverine on the trail some 400 yards away. They had three Dogs, including a famous Bear-dog named Kuorak. These they turned loose. The Dogs made about three jumps to the Wolverine's one, and soon they overtook him. The Wolverine turned at bay. The men saw the Dog come again and again within 15 or 20 feet of the Wolverine, but at once recoiled before the fierce counter-attack. At last, the Dog skulked back to camp, and the victorious Wolverine galloped off.

So also writes Walter Fry, who knew the Wolverine in his mountain home, the High Sierra of California. These details from his wilderness journal he sends me: "The Wolverine, commonly speaking, is not an aggressive animal, but will fight desperately when attacked, or for the care of its young. When once engaged in combat, the beast knows no such thing as retreat; dying, if need be, but never falling back. He fights on as long as a single spark of life remains. Mountain Lion, Bear, and Mountain Coyotes, whether coming singly or collectively upon a Wolverine, seem to fully realize his ferociousness, and quickly give way."[90]

"*Sequoia National Park, July 30, 1906.* Two adult Bear, one black and one brown, gave over to one adult Wolverine, with excitement and great haste, at Buck Canyon, the carcass of a cow upon which they were feeding.

"*Oct. 1, 1907.* Three large Mountain Coyotes that were feeding on the carcass of a Horse at Grouse Flat, vacated the vicinity immediately upon the approach of one medium-sized Wolverine.

"*Sept. 30, 1908.* One large and one medium-sized Mountain Lion were feasting on a Deer that they had recently killed at Willow Meadows,

[89] Journey, p. 372.

[90] The Wolverine, p. 130.

PLATE LXVIII.—TRACKS OF WOLVERINE (NATURAL SIZE)

Artillery Lake, Sept. 4, 1907

The small pads and occasional thumb-mark distinguish them from Wolf tracks. The series of

but after much growling and threatened resistance on the part of the larger Lion, both gave way to the approach of one medium-sized Wolverine."[91]

Two mighty Lions, each at least 150 pounds, one Wolverine of less than 20 pounds—and yet the two great gallant beasts surrendered without a fight! Surrendered to what? Not a stronger body, but a stronger personality, a more compelling and masterful soul. Surely, "there is a majesty that doth invest a King," an authority which is the God-mark on him. Is he not well styled "King Beast of the Sierras"?

Possessed of a Devil

Henry Bannon writes of his hunt on the Clearwater River of Alaska: "I killed a Bear, and, thinking the carcass might prove a bait, I went back to it after letting it lie for a day or two. As I drew near, an animal ran away. This time there was no doubt as to its identity; it was a Wolverine.

"My companion decided to trap him in order to rid himself of the pest, quite as much as to get his valuable fur. When we returned with the traps, we discovered that the Wolverine had skillfully cut off the Bear's hind leg at the second joint, and dragged it away. The Glutton had also eaten much of the meat around the joint. We set two traps where the Wolverine had been feeding, both of which we attached to a clog. Then we cut off the Bear's head, tied it to a near-by tree on a small bank and built up around the bait a low pen of driftwood, leaving an opening at the side where another trap was set. All traps were lightly covered with sand and dry leaves, and a green twig was laid on the top of each.

"The trapper ventured a guess that the third trap would circumvent the Wolverine.

"The next morning, we found that the plan had worked, for the Wolverine was securely caught in the trap under the Bear's head. In his desperation, the animal had gnawed the heavy brush, had broken down the smaller growths, and had torn up the ground as far as the chain would permit.

"He fought viciously when we approached. So tenacious of life is this 'Indian Devil,' as the Indians call him, that he could not be killed with a club. We had to beat him into insensibility and then cut his throat; but, at the thrust of the knife, he partly recovered, and continued to fight as his life ebbed away."[92]

For another illuminating story of the wilds and the Indian Devil, we

[91] The Wolverine, p. 131.

[92] Forest & Stream, Dec., 1921, p. 539.

are indebted to Robert Watson. It at least reflects the hunters' views, if it does not explain the unholy cleverness of Keewaharkess.

"No sooner," says Watson, "did we get on to the trap line than we saw signs of that most hated of all the trapper's enemies—the Wolverine. How George [their guide] cursed that brute as its tracks showed up ahead of us, following the line with unerring instinct, and visiting every trap on that particular lay.

"'Do you wonder at a trapper getting sore at a brute like that?' George said, 'and there isn't a bounty on it, although a Wolverine kills more Deer and grouse than the Coyote does. As for fur, he destroys it for the sake of destroying Leave a skinned carcass around, and he won't look at it, but he'll rip a Marten fur to ribbons out of a trap, just for the fun of doing it.'

"'Don't you ever catch them?' I asked.

"'Once in a blue moon! But most times, the brutes won't be caught. I have several fall traps of wood, set on this run, for the Wolverine shies clear of anything made of metal. Do you know, the Wolverine has forgotten more about trapping than most trappers know. We trappers are sure that when one of us dies, his spirit becomes a Wolverine, and he has to follow the lines, sort of paying for what he did when he was a trapper himself, tormenting perdition in the heart of the live trapper as he goes. He gets freed of his sins when he gets caught, but it seems part o' his punishment that he has to try his darnedest not to get caught and, knowin' most o' the tricks o' the trapper beforehand, it takes a new one to get him.'"[93]

Still another witness offers testimony that contains aboriginal recognition of the Wolverine's diabolic affinities. E. W. Nelson, writing of the North, says:

"The Wolverine is one of the most detested animals found in all the fur country. Its life is a continual warfare against all living things, and every man's hand is against it. They invariably steal the bait from traps whenever they have the opportunity, and very rarely do they get caught. Should they find an animal in the trap, they make short work of it, and in northern Alaska, as elsewhere in the fur country, they sometimes take up a line of traps so persistently that the hunter is forced to abandon it and look for a new route.

. . . . . .

"Marten trappers sometimes mourn the destruction of an entire set of traps in a day, and when one of these pests is caught, there is great satisfaction.

[93] Forest & Stream, Nov., 1923, p. 661.

"The Yukon Indians have a superstitious dread of this animal, and on one occasion that came to my hearing, a hunter found a Wolverine caught and hung between heaven and earth in one of his Lynx traps, about which the Wolverine had been prowling. Such an unusual occurrence as this, aroused the Indian's suspicions of bad medicine, for who ever heard of a Wolverine being caught in so simple a trap! Straightway the Indian returned home, and a grave consultation was held among the elders of the village. It was finally decided that the hunter might take the animal from the snare, but to avert possible bad consequences, he was instructed to abuse the white men all of the time, so as to make the spirit of the Wolverine believe it was owing to their agency that he had been trapped. The hunter then returned with a companion to the trap, and removed the animal, repeating, as he did so, nearly his entire stock of English in saying, 'G—— d—— the Americans, G—— d—— the Americans,' over and over again until well away from the accursed spot."[94]

The Wisdom of Keewaharkess

We have seen the Wolverine proclaimed King Beast of the Sierra, and we remember that many a king has made a brief success with an equipment of strength and courage. But permanence must have the third support of wisdom. How wise is he—King Carcajou? "Supernaturally, diabolically wise," is the answer, the wail of every trapper in the snowland where he and Keewaharkess meet in show-down match of wits and grit.

We have learned from Richardson of the strength and persistency of the Wolverine in breaking open a cache of food, etc. The author continues: "Once admitted into the hoard, it has to gnaw the pieces of meat asunder, as they are generally frozen together, and then it proceeds to drag them out one by one, and to bury them in the snow, each in a separate place. As it travels backwards and forwards over the meat, it smears it with a peculiarly fetid glandular secretion, after which no other animal will touch it. In this way, one of these beasts will spoil a large cache in an hour or two, and wholly empty it in a few nights. The pieces which are carried off are so carefully concealed in the snow, and the Wolverine makes so many tracks in the neighbourhood, that it is difficult to trace out the deposits and they are seldom found."[95]

"In which case," as Thomas Hutchins says, "they furnish a regale to the hungry Fox, whose sagacious nostril guides him unerringly to the spot.

[94] Alaska, p. 249.

[95] Arc. Search Exp., II, p. 86.

Two or three Foxes are often seen following the Wolverine for this purpose."[96]

All Northern traders grow eloquent on the subject of this animal's diabolic pertinacity and destructiveness.

"The winter I passed at Fort Simpson," writes Lockhart, "I had a line of Marten and Fox traps and Lynx snares, extending as far as Lac de Brochet. Visiting them on one occasion, I found a Lynx alive in one of my snares, and being indisposed to carry it so far home, determined to kill and skin it before it should freeze. But how to cache the skin till my return? This was a serious question, for Carcajou tracks were numerous. Placing the carcass as a decoy in a clump of willows at one side of the path, I went some distance on the opposite side, dug a hole with my snowshoe about 3 feet deep in the snow, packed the skin in the smallest possible compass, and put it in the bottom of the hole, which I filled up again very carefully, packing the snow down hard, and then strewing loose snow over the surface till the spot looked as though it had never been disturbed. I also strewed blood and entrails in the path and around the willows. Returning next morning, I found that the carcass was gone, as I had expected it would be, but that the place where the skin was cached was apparently undisturbed. 'Ah! you rascal,' said I, addressing aloud the absent Carcajou, 'I have outwitted you for once.' I lighted my pipe, and proceeded leisurely to dig up the skin to place in my muskimoot. I went clear down to the ground on this side and on that, but no Lynx skin was there. The Carcajou had been before me, and had carried it off along with the carcass; but he had taken the pains to fill up the hole again and make everything as smooth as before!

"At Peel's River, on one occasion, a very old Carcajou discovered my Marten road, on which I had nearly 150 traps. I was in the habit of visiting the line about once a fortnight; but the beast fell into the way of coming oftener than I did, to my great annoyance and vexation. I determined to put a stop to his thieving and his life together, cost what it might. So I made 6 strong traps at as many different points, and also set 3 steel traps. For three weeks I tried my best to catch the beast, without success; and my worst enemy would allow that I am no green hand in these matters. The animal carefully avoided the traps set for his own benefit, and seemed to be taking more delight than ever in demolishing my Marten traps and eating the Martens, scattering the poles in every direction, and caching what baits or Martens he did not devour on the spot.

"As we had no poison in those days, I next set a gun on the bank of a little lake. The gun was concealed in some low bushes, but the bait was so

[96] F. B. A., I, p. 43.

placed that the Carcajou must see it on his way up the bank. I blockaded my path to the gun with a small pine tree which completely hid it. On my first visit afterwards, I found the beast had gone up to the bait and smelled it, but had left it untouched. He had next pulled up the pine tree that blocked the path, and gone around the gun and cut the line which connected the bait with the trigger, just behind the muzzle. Then he had gone back and pulled the bait away, and carried it out on the lake, where he lay down and devoured it at his leisure. There I found my string. I could scarcely believe that all this had been done designedly, for it seemed that faculties fully on a par with human reason would be required for such an exploit, if done intentionally.

"I therefore rearranged things, tying the string where it had been bitten. But the result was exactly the same for three successive occasions, as I could plainly see by the footprints; and, what is most singular of all, each time the brute was careful to cut the line a little back of where it had been tied before, as if actually reasoning with himself that even the knots might be some new device of mine, and therefore a source of hidden danger he would prudently avoid. I came to the conclusion that *that* Carcajou ought to live, as he must be something at least human, if not worse. I gave it up, and abandoned the road for a period.

"On another occasion a Carcajou amused himself, much as usual, by tracking my line from one end to the other, and demolishing my traps as fast as I could set them. I put a large steel trap in the middle of a path that branched off among some willows, spreading no bait, but risking the chance that the animal would 'put his foot in it' on his way to break a trap at the end of the path. On my next visit I found that the trap was gone, but I noticed the blood and entrails of a Hare that had evidently been caught in the trap, and devoured by the Carcajou on the spot. Examining his footprints, I was satisfied that he had not been caught, and I took up his trail.

"Proceeding about a mile through the woods, I came to a small lake, on the banks of which I recognized traces of the trap, which the beast had laid down in order to go a few steps to one side to make water on a stump. He had then returned and picked up the trap, which he had carried across the lake, with many a twist and turn on the hard crust of snow, to mislead his expected pursuer, and then again entered the woods. I followed for about half a mile farther, and then came to a large hole dug in the snow. This place, however, seemed not to have suited him, for there was nothing there. A few yards farther on, however, I found a neatly built mound of snow on which the animal had made water and left his dirt; this I knew was his cache. Using one of my snowshoes for a spade, I dug into the hillock

and down to the ground, the snow being about 4 feet deep; and there I found my trap, with the toes of a Rabbit still in the jaws. Could it have been the animal's instinctive impulse to hide prey that made him carry my trap so far, merely for the morsel of meat still held in it? Or did his cunning nature prompt him to hide the trap, for fear that on some future unlucky occasion, he might put his own toes in it, and share the Rabbit's fate?"[97]

To this bewildering evidence of sagacity, Dr. Coues adds: "This propensity of the Wolverine to carry off traps, receives confirmation from other sources. In Captain Cartwright's Journal, II, p. 407, a similar instance is recorded in the following terms: 'On coming to the foot of Table Hill, I crossed the track of a Wolvering with one of Mr. Collingham's traps on his foot; . . . . . the Foxes had followed his bleeding track. As this beast went through the thick of the woods, under the north side of the hill, where the snow was so deep and light that it was with the greatest difficulty I could follow him, even on Indian rackets, I was quite puzzled to know how he had contrived to prevent the trap from catching hold of the branches of trees, or sinking in the snow. But on coming up with him, I discovered how he had managed. For, after making an attempt to fly at me, he took the trap in his mouth, and ran upon three legs. . . . . These creatures are surprisingly strong in proportion to their size; this weighed only 26 pounds and the trap 8; yet, including all the turns he had taken, he carried it 6 miles.'"[98]

"The hunter," says Lockhart, "may safely leave an animal he has killed, for one night, but never for a second time, without placing it in a strong cache of logs. The first night, the Wolverine is pretty sure to visit the place, but will touch nothing. The next night, he is certain to return, and, if he can possibly get at the meat, he will gorge himself, and then make away with the rest, which he cunningly hides, piece by piece, under the snow, in different directions. At every cache he makes, he voids his urine or drops his dirt, probably to prevent Foxes, Martens, or other animals from smelling the hidden meat and digging it up. Caches must be made of green wood and be exceedingly strong, or the animal will certainly break into them. He has been known to gnaw through a log nearly a foot in diameter, and also to dig a hole several feet deep in frozen ground, to gain access to the coveted supply. Should he succeed in gaining entrance for himself, and yet be unable to displace the logs sufficiently to permit of removal of the meat, the brute will make water and dirt all over it, rendering it wholly unfit to be used; even a Dog will then scarcely touch it.

[97] Fur-bearing, pp. 52–55.

[98] Fur-bearing, p. 55.

"To the trapper, the Wolverines are equally annoying. When they have discovered a line of Marten traps, they will never abandon the road, and must be killed before the trapping can be successfully carried on. Beginning at one end, they proceed from trap to trap along the whole line, pulling them successively to pieces, and taking out the baits from behind. When they can eat no more, they continue to steal the baits and cache them. If hungry, they may devour two or three of the Martens they find captured, the remainder being carried off and hidden in the snow at a considerable distance. The work of demolition goes on as fast as the traps can be renewed."[99]

"They frequently follow a sledge party in the interior for days," says Nelson, "visiting every camp as soon as it is abandoned, in order to pick up the scraps left. . . . It is almost impossible to render a provision cache safe from them, if it is left for any considerable length of time."[100]

Dr. R. M. Anderson writes me:

"*Dease River, N. W. T., Jan. 28, 1911.* Harry Hodgson says that they have only about one week's supply of meat left, out of 76 Caribou killed by them during the fall and winter. The Wolverines have stolen the bulk of the meat. White men and Indians in this region seem to look upon the depredation of Wolverines as fated and unpreventable; they take them, like mosquitoes, as a matter of course."[101]

"The propensity to steal and hide things," says Coues, "is one of the strongest traits of the Wolverine. To such an extent is it developed that the animal will often secrete articles of no possible use to itself. Besides the wanton destruction of Marten traps, it will carry off the sticks and hide them at a distance, apparently in sheer malice. Mr. Ross . . . has given an amusing instance of the extreme of this propensity: 'The desire for accumulating property seems so deeply implanted in this animal that, like tame ravens, it does not appear to care much what it steals, so that it can exercise its favourite propensity to commit mischief. An instance occurred within my own knowledge, in which a hunter and his family, having left their lodge unguarded during their absence, on their return, found it completely gutted—the walls were there but nothing else. Blankets, guns, kettles, axes, cans, knives, and all the other paraphernalia of a trapper's tent, had vanished, and the tracks left by the beast showed who had been the thief. The family set to work and, by carefully following up all his paths, recovered, with some trifling exceptions, the whole of the property.'"[102]

[99] Fur-bearing, pp. 50–51.

[100] Alaska, p. 249.

[101] Personal letter.

[102] Fur-bearing, p. 51.

How are we to account for this conduct? In ancient days or barbarous countries, it would be said that the creature was possessed of a devil, and no further explanation considered necessary. This is not quite satisfactory to-day. The Wolverine undoubtedly follows the trapper because it is hungry, and sees a chance of securing a bellyful. Having found food, it takes possession of it in a manner of wide usage. As already noted, small boys and Eskimos signalize their ownership by spitting on the object, Squirrels by licking it, Foxes by urinating on it, and Badgers and several Weasels, including the Wolverine, by anointing it with the oil of their anal glands. This is a potent method that carries strong conviction among most creatures that have retained unimpaired the sense of smell. If the Wolverine be not hungry, its provident instinct prompts it to put the possible food away for some day of worse luck, and, acting on the principle "better safe than sorry," it brands again in detail with its execrable odour the treasure trove. In so doing, other things, sticks, pots, etc., with an interesting odour of grease, are accidentally touched with the oil, the convincing holy oil of the anal glands; and so by a process not without parallel in other worlds, they are converted to its use, and receive the honour of a cache unto themselves. It is not to be supposed that any part of the procedure is due to malice. Malice is a human weakness. Animals are not built that way.[103]

Trapping the Destroyer

Back in the '80's, when I lived at Carberry, Man., there was a half-breed trapper near Lake Manitoba, who was "picked on" by a Wolverine. It ravaged his trap line from end to end, with evident enthusiasm, over and over again. It destroyed his catch, and lived on his baits. It was likely to spoil his whole winter, till he hit on a clever scheme.

He bent down a strong young birch spring pole, tying it to another tree some 6 feet from the ground. At the angle between the two, he made a bundle of sacking, in the middle of which was a lump of meat—the whole thing an evident cache.

When finally arranged, he tied the spring pole down with one stout cord over the bundle, cutting the cords first used. In each of the spaces between trees that were about 6 feet away, he carefully concealed a Wolf trap without any bait.

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[103] R. M. Anderson writes me in comment on the above: "I have seen many caches opened by Wolverines, some partly, some wholly, cleaned out; but I never saw or heard any of the Eskimo tell of any filth or glandular secretion being left behind by the Wolverine. This may be only an Indian folklore story. Even in a trap, the Wolverine is not odoriferous."

A light snowfall that night helped the trapper.

Next morning, to his joy, he found the "Devil" clutched in two powerful traps, ashamed but defiant as he crouched. His green-lit eyes, bristly hair, and deep bear-like growls, made a memorable picture of futile animal rage.

Avoiding the traps, it seemed he had climbed on the cache, and, as usual, began to tear into it. First he had cut the binding cord. The spring tree released, had thrown him up in the air, and he had fallen on one of the grim, inexorable traps. Springing away in sudden terror, he forgot to look out for other traps, and so fell into No. 2, and—his days of adventure were over.

Baffling the Carcajou

Aside from various tricks to decoy it into a trap, there are at least four ways of solving the Wolverine problem. The first is given by Richardson, in his 1848 Journey, thus: "Rae, however, made a safe cellar by cutting a hole in the ice, covering it thickly with snow, and then pouring water over all until the frost had rendered the whole a solid mass."[104]

The second method is given by Professor H. Y. Hind in his "Exploration of Labrador."[105] An Indian, he says, had to cache his bundle of furs, so hung them in a tree ten feet from the ground, with a couple of sleigh bells dangling from it; sure that the Wolverine would climb the tree and leap on the bundle, but equally sure that the loud ringing of the bells would instantly scare the crafty one away.

Another plan is recorded by Nelson. He says: "Anything left in a tree for safe-keeping is sure to be destroyed if the Wolverine can get at it. The fur-traders usually outwit them by a very simple plan. They place the articles they wish to leave, in a tree, and then remove the outer bark of the tree for 5 or 6 feet from the ground. The frost renders the smooth, bare trunk so hard that the animal's claws cannot obtain a hold, and he is unable to climb the tree in consequence."[106]

Somewhat on similar lines is an effectual method that I learnt from J. W. Tyrrell, and put in practice during my journey in the Far North. The cache is made weatherproof and rainproof, then left high in a tree, to whose trunk a final finish is given in the form of a complete necklace of cod hooks, points downward. Hitherto this has proved very satisfactory.

The last and only infallible method is by the use of strychnine. There is, however, a widespread feeling against this. The Indians believe it to

[104] Arc. Search. Exped., II, p. 86.

[105] As above, 1863, I, p. 50.

[106] Alaska, p. 249.

be an unholy practice that will surely draw down the wrath of the Great Spirit. The trappers say that it spoils the fur of the animal poisoned, and tends to ruin all the trapping, as one strychnine bait may claim many victims. Nevertheless, the natives use poison for Wolverines, secretly, but whenever they can get it; just as they also lose no chance of getting certain other contraband poisons for their personal use.

A unique case reminiscent of Æsop and the starving Mouse is this one by Nelson: "Their greediness overmatches their cunning at times, and a fur-trader told me of an instance where a returning trapper caught one of them in his cabin, so gorged upon the dried meat he had found that he was unable to escape through the chimney by which he had entered, and so died ignominiously at the hands of the enraged hunter."[107]

Foolish Wolverines

While trappers are of one voice in ascribing to the Wolverine incredible sagacity, "the cunning of ten men," there are undoubtedly simpletons among them; or regions, perhaps, in which simplicity prevails. There, no doubt, are districts in which the resident Wolverines have not been educated by lifelong conflict with traps and trappers. Thus Anderson says that about Great Bear Lake, where little hunting is done, the Wolverine are not suspicious, and will go into any kind of a trap. We must assume that their trap-wisdom is the result of persecution. Without such assumption, it would be impossible to explain the mild and fearless curiosity, the guilelessness reflected in the following snapshots from the trappers' outlook.

The first is from Captain George Cartwright's Journal of "16 Years in Labrador," long, long ago:

"*Tuesday, Feb. 4, 1772.* After breakfast, Mr. Bullock and I went up Island Brook, where we saw the tracks of 2 Wolverings, one of which had been caught by a hook, that I had hung from the branch of a tree, with a bait upon it, and had broken it; he afterwards got into a trap which was not far off, and carried it to some distance, where the creeper [drag] caught hold of a bush, and he escaped after a very long struggle."[108]

As we have already seen in the section "What Does He Do When——?" a Wolverine came openly and stupidly to Captain Ross's vessel, and boarding it in the presence of 12 or 14 busy men, allowed itself to be tamely noosed.

The Wolverine was found by Grinnell and Storer in the Yosemite. Their record is as follows: "Inclusion of the species here, is based upon the

[107] Alaska, p. 249.

[108] P. 98, 1911 ed.

capture of two individuals at the upper end of Lyell Canyon, late in July of 1915, by Mr. Charles L. Camp of our party."[109] Both were taken in steel traps, apparently with little difficulty, which probably means that in this region, the species has not been educated by a long warfare with hunters and trappers.

The Doom of the Wolverine

But these simpletons are rare. The Wolverine has shown his long trap-wisdom. Nevertheless, his doom is spoken. He has enrolled a host of enemies; for every hunter, trapper, and farmer on his range considers him a bandit, an atrocious robber, a creature of such malignity that he must be destroyed by any means, fair or foul, and at any time.

His magnificent robe is so much in demand now that the market-rating of choice pelts, amounts to a bounty on his head.

The scarcity of game on his winter range during off-years for Rabbits, often compels him to a step that amounts to suicide. As already pointed out, the famished Wolverine had no chance to learn discretion in the matter, and when he meets a Porcupine, he slays the dull Quill-pig, revels in its blood and meat. This stays his hunger—yes. But the arrows of death are in him, and a week or two later, the Quill-pig's revenge is complete.

He is nearly gone from the United States now. In southern Canada, he is become very scarce. In his own kingdom, the treeless North, he is found in fair numbers; but each year, the trappers and hunters swarm in every part of this range. It cannot be a question of many years before the wise and valiant Wolverine is known only by musty skins and dusty records.

His Character

The Wolverine is a tremendous character. No one can approach the subject of his life and habits, without feeling the same sort of embarrassment one would feel in writing of Cromwell or Tamerlane. Here, we know, is a personality of unmeasured force, courage, and achievement, but so enveloped in mists of legend, superstition, idolatry, fear, and hatred, that one scarcely knows how to begin or what to accept as fact.

Picture a Weasel—and most of us can do that, for we have met that little demon of destruction, that small atom of insensate courage, that symbol of slaughter, sleeplessness, and tireless, incredible activity—picture that scrap of demoniac fury, multiply that mite some fifty times, and you have the likeness of a Wolverine.

[109] Animal Life in the Yosemite, p. 85.

He is not an animal—that I was assured in my earliest days of hearing his name. He is the Evil One, Kee-wa-har-kess, the Indian Devil, the lost soul of a great hunter, whose only pleasure now is pursuing other hunters, and plaguing them unto madness, till, in some weird way, they strike a bargain with him, and join his company of the damned.

It sounds like Milton's Satan, one-time mightiest of the Angels, but fallen through pride, to be the Evil One, the enemy of those who kept the better way.

Has not Longfellow crystallized the thought in Iagoo's story of the coming of summer? The bright days were all held up in the sky by a weather-proof dome. All the strong and clever beasts essayed in vain to break through the barrier and let out the summer weather—

> How the Otter first essayed it;
> How the Beaver, Lynx and Badger
> Tried in turn the great achievement,
> From the summit of the mountain,
> Smote their fists against the heavens,
> Cracked the sky, but could not break it;
> How the Wolverine, uprising,
> Made him ready for the encounter,
> Bent his knees down like a Squirrel,
> Drew his arms back like a cricket.
>
> . . . . . .
>
> "Once he leaped, and lo! above him
> Bent the sky, as ice in rivers,
> When the waters rise beneath it;
> Twice he leaped, and lo! above him
> Brake the scattered sky asunder,
> And he disappeared within it."

My school books were lit up a little with a lurid chapter of the weird and terrible Wolverine. An account was given, a condensation of the stories told by Hearne, Richardson, Hind, and many more whose names stand high in the snowland temple of Fame.

I have those very books before me now, and I read with better insight, with larger overlook. Here I have given these stories by the men who knew and suffered from Keewaharkess, the Giant Weasel, the Wolverine. I am using them as pigments wherewith to paint my picture of a wonderful character. I hope I have dealt fairly with the material. My aim is to tell the truth, to set forth a trustworthy Life. I have tried to keep the attitude of impartiality, to disguise the fact that, right or wrong, my heart

is with the wild beast. I wish it were in my power to give him victory complete.

References for Wolverine

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1795—Journey to the Northern Ocean, by Samuel Hearne.
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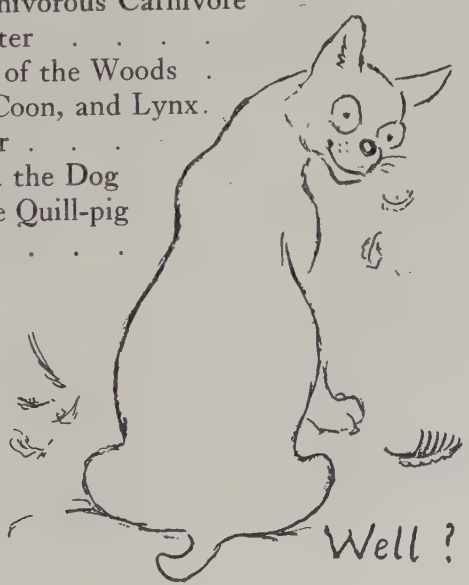

Pekan, Fisher, Fisher-marten, Fisher-cat, Tree-fox, Pekan-weasel, Fisher-weasel, Blackcat, or Pennant Marten

Martes pennanti (Erxleben)

(L. *Martes*, a Marten; *pennanti*, in honour of Pennant, the Welsh naturalist)

[*Mustela*] *pennanti* Erxleben, 1777, Syst. Regn. Anim., I, p. 470.
Martes pennanti Miller, 1912, North Amer. Land Mamm., p. 94.

Type Locality—Eastern Canada; that is, Quebec.

French Canadian, *le Pekan.*
Cree, Ojibway, and Sauteaux, *Oo-djeeg*, or *Otchoeck.*
Chipewyan, *Tha-cho* (Big Marten).

The name "Pekan," first recorded by Charlevoix (1744), and popularized by Buffon (1765), is the Abenaki name, adopted without change.[1] It is used chiefly in books, but has some currency among the French Canadians.

In Trumbull's Natick Dictionary, the name given is *Pekane.* C. G. D. Roberts tells me that in Micmac, it is called *Pekwahm*, and Tappan Adney that the Melecite is *P'gumpk*, or sometimes *Pekonk.*

"Wejack, the appellation under which Hearne mentions it, is a corruption of its Cree or Knisteneaux name, *Otchoeck*, and the word 'Woodshock' has a similar origin."[2]

Most writers have used the name Fisher, yet condemned it on the grounds that the animal does not fish. But we must remember that the name was given in contrast with the Marten. One was Pine Marten, the other Fisher Marten. It will be seen later that it not only feeds by preference on fish, but it is partial to swamps and other wet places, and is known to take long swims; a habit not recorded for the Pine Marten, which shows a preference for the high dry woods.

DeKay says: "The name of Fisher, which has been censured as not applicable to this animal, is, however, that by which it is best known, and which it has received from its characteristic habits. Richardson states

[1]Rasles, Abenaki Dict.

[2]F. B. A., 1829, I, p. 53.

that it feeds on the hoards of frozen fish stored up by the residents. We are informed by a person who resided many years near Lake Oneida, where the Fisher was then common, that the name was derived from its singular fondness for the fish used to bait traps. The hunters were in the practice of soaking their fish overnight, and it was frequently carried off by the Fisher, whose well-known tracks were seen in the vicinity. . . .

"It appears to prefer marshy wooded swamps, and the vicinity of lakes and water courses."[3]

In the section dealing with its food, it will be seen that, according to Paul Fountain, it prowls about stagnant pools and small shallow lakes, preying on reptiles, shell-fish, and fish which it catches with its paws in the water. Thus, compared with the Pine Marten, it is much of a "fisher."

In Ontario, the name Blackcat prevailed, and in Vermont, Fisher Marten.

In addition to the generic characters, which it shares with the Marten, the Fisher has the following:

Size. Total length, about 36 in. (915 mm.); tail, 14 in. (356 mm.); hind foot, 4 in. (102 mm.). The ♀ is smaller.

Weight. Bachman gives 8½ lbs. as the weight of a young ♂. M. Hardy, after weighing many, found them "the smallest, 8¼; the largest, 12½ lbs."[4]

"*Weight* (from specimens taken elsewhere [than the Yosemite] in California), 8 to 10 lbs. for ♂'s, 4 to 5½ lbs. for ♀'s.[5]

B. R. Ross says the largest he ever caught was 18 lbs.[6] This is the record to date.

Another, described by Ross, was "as large as a middle-sized Otter,"[7] which implies a weight of not more than 20 lbs.

When in its natural surroundings, the Fisher suggests a big black Cat with bushy tail, or else a black Fox, according as it is seen in the trees or on the ground.

Colour. In general, its colour is grayish brown or brownish black, lighter on the sides, browner below; darker, sometimes quite black, on

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[3] Nat. Hist. N. Y., I, p. 32.

[4] Forest & Stream, June 4, 1910, p. 888.

[5] Grinnell & Storer, Animal Life in the Yosemite, 1924, p. 83.

[6] Pop. Treatise, p. 24.

[7] As above, p. 24.

snouts, ears, feet, and tail; and on the head, neck, and shoulders, so much tipped with whitish, that it has a grizzly gray appearance; the ears have pale linings. Like all of the group, it varies greatly in intensity of colour. The claws are whitish horn-colour.

A good specimen from Monadnock, N. H. (No. 24243 Am. Mus.), is in general of a warm wood-brown, grayer on the head; warmer on the rump; all above, overlaid with long, black hairs; the legs, feet, snout, and tail, glossy black; the breast, belly, and inside of legs, umber brown, more or less lined with long hairs of a pale brown; back of the ears, blackish brown, inside, dull whitish brown; claws, whitish horn-colour.

Another is darker and browner; a third is paler.

"Young full-furred specimens, or those born the previous spring, can scarcely be distinguished from a large Marten, except by a darker pelage and a less full, more pointed tail. As it advances toward old age, the colour of the fur grows lighter, the long hairs become coarser, and the grayish markings are of greater extent, and more conspicuous.

"The largest Fisher which I have seen was killed by myself on the Rivière d'Argent, one of the channels of the mouth of Slave River, about 15 miles from Fort Resolution. It was fully as long as a Fulvous Fox, much more muscular, and weighed 18 pounds. In the colour of its fur, the grayish tints preponderated, extending from halfway down the back to the nose. The fur was comparatively coarse, though thick and full. The tail was long and pointed, and the whole shade of the pelage was very light and had rather a faded look. Its claws were very strong and of brown colour; and as if to mark its extreme old age, the teeth were a good deal worn and very much decayed."[8]

Skull. From whatever viewpoint one approaches the Fisher, one is impressed with its remarkable individual variation. The divergence in skulls is the subject of a paper by Oldfield Thomas. It refers to two adult male Fisher skulls brought him from Canada:

"Of their specific identity, there can be absolutely no question, although I have found it difficult to make most people to whom I have shown them, believe in that fact." They should, as Thomas remarks, "put the species-maker on his guard."[9]

The drawings are reproduced in the accompanying Plate. (P. 467.)

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[8] Pop. Treatise, p. 24.

[9] Notes on a Striking Instance of Cranial Variation Due to Age, Proc. Zool. Soc., London, Feb. 16, 1886, pp. 126–27.

MAP VIII.—RANGES OF FISHER OR PEKAN AND OF LITTLE SPOTTED SKUNK

By E. T. Seton, with assistance of the Biological Survey

Range of Fisher or Pekan, chiefly in Canada, but reaching down the Alleghanies to North Carolina, down the Rockies to Yellowstone Park, and down the West Coast mountains to California and the Yosemite, with an isolated population on the Blue Mountains of northeastern Oregon.

Range of Little Spotted Skunk, chiefly in the United States and Mexico, reaching Canada only in British Columbia, overlapping the Fisher in the Appalachian Mountains, the Alleghanies, the West Coast range, and the Sierra.

Races

Two races are recognized:

pennanti Erxleben, the typical form. T. l., Quebec.
pacifica Rhoads, with larger skull and upper molars; also some colour differences, chiefly brown below instead of black. T. l., Lake Keechelus, Kittalas Co., Wash.

Range, Ancient and Modern

The Fisher was found in the great pine and spruce forests, from Nova Scotia to latitude 62° on the Mackenzie River, near Great Slave Lake, and west to the Pacific Ocean, with a long arm of territory reaching down the mountains, through the Alleghanies to South Carolina; another down the Rockies to Wyoming; a third down the Cascades and Coast Ranges to central California; and yet another on the Pacific watershed, northward to north-central British Columbia in the interior. It is apparently absent from the Alaska Panhandle. These facts are set forth on Map VIII.

That area is much shrunken to-day. The Pekan is a forest animal, and has retired with the destruction of the forests. It is probably extinct now in all the eastern United States, except Maine. It is gone from the Ontario Peninsula, southern Michigan, and Wisconsin. It will soon be extinct in California and Oregon. And in all of its range, it is greatly reduced in numbers.

For details on its range, the following records may be referred to:

Nova Scotia (J. Bernard Gilpin, Mamm. Nova Scotia, Trans. N. S. Inst. Nat. Sci., Nov. 5, 1866, pp. 9–10); New Brunswick (A. Leith Adams, Field and Forest Rambles, 1873, p. 295); Gaspé Pen. (G. G. Goodwin, Mamm. Gaspé Pen., Que., *Journ. Mamm.*, Nov., 1924, p. 253); Labrador and Quebec (Martin Hunter, Canadian Wilds, 1907, p. 131); Maine (Manly Hardy, *Forest & Stream*, June 4, 1910, p. 889); New Hampshire (specimen in American Museum No. 24243); Vermont (Zadock Thompson, Nat. Hist. Vermont, 1853, p. 32); Massachusetts (Ebenezer Emmons, Quads. Mass., 1840, pp. 39–40); New York (James E. DeKay, Zool. N. Y. State, 1842, pp. 31–32; also, Bachman, Q. N. A., I, 1849, p. 310; also C. H. Merriam, Mamm. Adir., 1884, p. 48); Ontario (Anthony Gapper, *Zool. Journ.*, Feb.–June, 1830, p. 203; also, Bachman, Q. N. A., I, 1849, p. 313; also Miller, Mamm. Ont., *Proc. Bost. Soc. Nat. Hist.*, April, 1897, p. 42; also, Dr. William Brodie, of Toronto, told me that in the '40's, the Fisher was generally distributed and common in the country just north of Lake Ontario; also,

Mark Robinson, Ranger of Algonquin Park, writes me (May 13, 1925) that Fisher "are plentiful in many parts of the Park); Pennsylvania and New Jersey (Rhoads, Mamm. Pa. & N. J., 1903, p. 179); Virginia, North Carolina, and Tennessee (Bachman, Q. N. A., I, p. 314); Michigan (N.A. Wood, Mich. Mamm., April 1, 1914, p. 10; also Dice & Sherman (Mamm. Gogebic & Ontonagon Cos., 1920, pub., 1922, p. 27); Indiana (Amer. Journ. Sci. & Arts, XLVI, 1844, p. 246); Illinois (Kennicott, Trans. Ill. State Agr. Soc., I, 1853–54, pub. 1855, p. 578; also Kennicott, Agr. Rep. for 1858, pub., 1859, p. 241); Wisconsin (Cory, Mamm. Ill. & Wis., 1912, pp. 387–89); Minnesota (C. L. Herrick, Mamm. Minn., 1892, p. 103); Manitoba (A. Henry, Journal, p. 155; also, MacFarlane, Mamm. N. W. T., pp. 709–10. Also, W. R. Hine saw one that was killed on the Assiniboine, near Headingly, some years ago, and had another which came from the Seine beyond Point du Chêne. I found it in the pine forest about Rat Portage, and have seen one or two brought from the region between Lakes Manitoba and Winnipeg. The Indians tell me that it is found on the eastern part of the north coast of Lake Winnipegosis, and on the south side of Dawson's Bay, but not elsewhere in that country). Saskatchewan (MacFarlane, Mamm. N. W. T., p. 709); Alberta (as above); Mackenzie (B. R. Ross, Mamm. Mack., p. 24. "The Fisher is generally distributed throughout the region north to Great Slave Lake, but is nowhere common. According to Robillard, it is very rare about Fort McKay. Two, however, were taken there during the autumn of 1906. C. Harding told us that about a dozen were taken each year in the country tributary to Fort Resolution. Thomas Anderson of Fort Smith informed us that the Fishers were very rare in that vicinity. An occasional one is traded from the Liard River, and in November, 1905, a small female was trapped near the mouth of the North Nahanni where it enters the Mackenzie. This was the northernmost record known to the natives to whom it was a new animal.")[10] British Columbia (MacFarlane, Mamm. N. W. T., p. 709); Montana (Bailey, Wild Animals of Glacier National Park, 1918, p. 50; also, Q. N. A., I, p. 314); Idaho (Merriam, N. A. F., 4, 1890, p. 84; also, when I camped in the Bitterroot Mountains of Idaho, in the fall of 1902, I saw occasional signs of Fisher and was told that it was not rare); Wyoming (When I lived in the Yellowstone Park in the summer of 1897, I made all inquiries, and was told by the hunters that the Fisher was unknown; Capt. George S. Anderson told me that about 1893, he had confiscated a skin taken by a poacher in the Park. All hunters assure me that the Fisher is never found in Jackson's Hole). Oregon and Washington (Lewis & Clark, Journ., Chap. VII, p. 178, Hosmer ed.; also, George Suck-

[10] Seton, Arctic Prairies, 1911, pp. 257–58.

ley, Nat. Hist. of Wash. Terr., 1860, pp. 92, 114; also, J. G. Cooper, Nat. Hist. of Wash. Terr., p. 76; also, Baird, Pac. R. R. Rep., VIII, 1857, p. 152); California (Merriam, N. A. F., 16, 1899, p. 106; also, Grinnell & Storer, Animal Life in the Yosemite, 1924, p. 83.)

Numbers and Fur

Nowhere in all its extensive range, can the Fisher be styled abundant, yet Hardy says: "It is by no means a rare animal in Maine, being about as plentiful back from the settlements as Otter. When in the fur trade, I used to buy 175 to 200 skins annually. While these were not all taken in Maine, I think, from the best data I could get, that the annual catch of Maine was 150 to 300. The catch varies greatly in different years, just as that of Sable does, as some years both take bait better than others."[11]

According to Dr. Bernard Gilpin, "150 to 200 are the very utmost now taken yearly [in Nova Scotia]."[12] The official fur returns at Ottawa show that for the last three years, 1922–23–24, the catch of Fisher pelts in Nova Scotia was 0, 0, 0.

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 377,338 skins of this species, an average of 4,439 for each year. The lowest was 974 in 1829; the highest, 8,917, in 1868.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 305,570 skins were taken by the other American companies, an average of 4,224 each year. So that the average annual catch of Fishers for fur is about 8,600.

The number of Fisher pelts taken in Canada during the 5 years, 1919–20 to 1923–24 inclusive, is officially reported as follows: 10,176; 4,866; 5,589; 3,976; 4,158; showing a painfully suggestive, nearly steady, diminution.

Joseph Dixon, of the University of California, warns us that we are now facing the extermination of Fisher, Marten, and Wolverine in California. The number caught by the licensed trappers in the State during the years 1902 to 1924 inclusive are as follows: Fisher: 102, 42, 27, 24, 34; Marten: 452, 227, 151, 137, 121; Wolverine: 2, 2, 1, 3, 0.

To this he adds: "At the present rate of decrease, there will be no Martens or Fisher left in California within 5 years," and urges that we "put on a short, closed season *now*, and give these animals a chance before it is too late."[13]

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[11] Shooting and Fishing, April 13, 1899, p. 526.

[12] Mamm. N. S., Inst. Nat. Sci., Nov. 5, 1866, pp. 9–10.

[13] Cal. F. & G., Jan., 1925, pp. 23–25.

The market quotations at Winnipeg for March, 1904, were: Prime, $4 to $9.

The highest price realized at Lampson's sales for March, 1906, was 52 shillings ($12.48) each for 24 first-class black skins. But 30 to 40 shillings ($7.20 to $9.60) were ruling prices for first-class paler skins; second-class brought about 20 shillings ($4.80), and third-class 15 shillings ($3.60).

Manly Hardy says he once sold a few extra fine dark skins in London for 100 shillings ($24), while some of the coarsest and palest prime skins in the same lot did not bring over 16 to 20 shillings ($3.84 to $4.80).[14]

But these represent bygone conditions and prices. During the great fur boom of 1919–20, the average price of Canadian Fisher was $84.43, with $125 and $150 for choice pelts. In 1920–21, the average fell to $58.86, and in 1921–22 rose again to $74.45, and in 1923–24 to $70.07. The record price was in 1920, when choicest Fisher brought $345.

Haunts and Home Range

The Fisher is essentially a forest animal, living on the ground or in the trees; but is not known to burrow, or habitually take refuge in holes underground. This, no doubt, is a weak place in its endowment; it must disappear with the forests. Only those forest animals that are also underground species, are able to hold their own against the axe of the pioneer. Good examples of this are seen in the Woodchuck, the Red-squirrel, and the Chipmunk.

Although not markedly aquatic, it seems to prefer the neighbourhood of swamps, especially if these be among large timber. In the Bitterroots of Idaho, I found it following the bed of a stream that was nearly dry. The trappers on the Ottawa tell me that it lives much more on the ground there than in the trees, and that it follows regular runways.

George Linklater, the Des Barats, Ont., guide, believes that the home range of the individual Fisher is smaller than that of the Marten. This hardly comports with the family habit, as their range usually corresponds closely with their size.

Madison Grant tells me that one of his British Columbia guides had a number of experiences with a large Fisher that appeared in his locality about every 10 or 15 days, apparently absent during the interval. No doubt, it had a very small home range while about the camp, but during the two weeks elsewhere, it probably changed its home locality half a dozen times. These observations tend to show that it has a certain beat, as have the Otter

[14] Shooting and Fishing, April 13, 1899, p. 526.

and Mink, a circle of perhaps a dozen miles around, along which it has dens that it frequents in turn.

Raymond S. Spears gives some interesting observations by Hy. Burke, the Adirondack trapper, on this animal's range. Referring to a certain giant Fisher, he discourses:

"The 'big un' had a regular beat along a little sag, or valley, which it followed, always going the same ways. Though the trapper's line extended miles to the eastward and westward, the Fisher's runway crossed it nowhere, save in the sag and on the outlet of a little lake where Burke had a short line of 5 traps. From there, the Fisher's runway extended around the ends of other loops 6 miles eastward and 8 miles to the north. Its runway must be more than 40 miles long, and Burke believes more than 100. 'I've seen the same Fisher's track on Cotton Lake Mountain and in Big Brook Swamp,' Burke said—points 20 miles apart."[15]

Mating, Den, and Young

The mating is believed to take place about the first of March, and I find among trappers a prevailing opinion that the species pairs.

The animal is so scarce, and its nest so well concealed, that the latter has but rarely been found. It is usually made in a hollow tree at considerable height from the ground, 30 or 40 feet; but has been found in logs, and rocky crevices. Although a Fisher is larger-bodied than a Fox, it can readily enter a hole but 4 or 5 inches in diameter.

The young are born about the first of May. They number from 1 to 5, 2 to 3 being usual. The only litter I ever saw, consisted of 3. Mark Robinson, Ranger of Algonquin Park, writes me that 3 is the average.

In May, 1899, a nest was discovered by some Indians in the woods north of Lake Winnipeg. It was, as usual, in the hollow of a standing tree, and about 40 feet up. The young, 3 in number, were bought by N. E. Skinner, in whose possession I saw them at Winnipeg on August 7th of that year. They were then about half grown, and exceedingly playful. They showed plainly their Marten affinities, and yet had a close resemblance to a family of Silver Foxes; consequently, I was not surprised to read in Kennicott's account that the species has, in some parts, been called the "Black Fox."

When quite small, the young appear to quit the nest and follow the mother, like young Martens. Professor Spencer F. Baird tells of an old female and one well-grown young one, that were treed in the Peter Mountains, 6 miles above Harrisburg, Pa., about the first of February. There

[15] Forest & Stream, April 6, 1907, p. 530.

PLATE LXIX.—WOLVERINE SPRINGING ON YOUNG CARIBOU

PLATE LXX.—PHOTOS OF FISHER
New York Zoölogical Park

was a most desperate fight before "the old one was killed, after having beaten off the Dogs, to whose assistance the hunters were obliged to come."[16]

The young one was taken alive; the old one was "no doubt the mother of the one that was captured, and probably died in hope of saving her young."

So far as is known, the young do not usually continue so long with the mother; and the father takes no part in rearing them.

But one brood is produced each year.

Sociability and Voice

Like most Weasels, this is neither sociable nor gregarious. I never heard of anything like a social gathering of Fishers.

Manly Hardy says: "I have known of several being found in company, but I think this very unusual."[17] It is essentially a solitary creature; therefore has but few methods of intercommunication.

Its vocal powers are fairly developed. Those from which I made the sketches, uttered an occasional snarl at each other. A Maine trapper writes: "Their noise is like a child when it cries in a mournful tone; and again, it makes a short, sharp whistle."[18]

Bachman describes a male that was treed, as "showing his teeth and growling at the same time . . . elevating his back in the manner of an angry Cat," and another as "very spiteful, growling, snarling, and spitting when approached," and emitting "a rather strong musky odour."[19]

Lew Aumock writes: "I have often read stories of someone hearing the call, or 'screech' of the Fisher in the woods. Now, of all the Fishers I have trapped, and all I have had in captivity, I have never yet heard one screech. All Fishers make a kind of a 'put, put, put,' noise, low and soft, and cannot be heard more than a few feet; except at mating time when they make a peculiar kind of noise which sounds a little like the grunt of a buck Rabbit. When a Fisher is angry, he will sweep the ground with his tail by throwing it from side to side."[20]

Habits in General

The Fisher is a true Marten, endowed with all the tricks, activity, and the peculiarities of the race.

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[16] Quoted in Q. N. A., I, pp. 312–13.

[17] Forest & Stream, June 4, 1910, p. 889.

[18] J. G. Rich, of Bethel, Me., Forest & Stream, June 24, 1886, p. 426.

[19] Q. N. A., I, pp. 310, 312.

[20] Raising Fisher, July, 1924, p. 56.

Doubtless, it has the anal glands of its group; but no one has commented on them, or seen them put to any definite use.

It is probably our most active arboreal animal. The Squirrel is considered a marvel of nimbleness, but the Marten can catch the Squirrel, and the Fisher can catch the Marten. So that we have here a scale of high-class agility, with the Fisher as superlative. L. Warfield, after much experience, says this animal is capable of "jumping from tree to tree like a Squirrel, clearing a distance of 40 feet in a descending leap, never failing a secure grip."[21] Bachman tells of Fishers leaping to the snow-covered ground from a height of 50 feet.[22]

In descending a tree, it often comes down head first. But for the Monkeys and some others, we might believe it a rule that no creature is truly at home in the upper world till it *can come down head first* when it likes.

Though so active in the tree-tops, it is equally at home on the ground; and is so indefatigable and long-winded, that it is known to run down Rabbits and Hares in open chase. If only it could swim and dive well, it would probably be the most wonderfully equipped animal in the world.

It has much of the blind pertinacity of the smaller Weasels. When I was at Rat Portage (now Kenora) in October, 1886, an Indian brought in a superb Fisher, fresh killed. He saw the animal chasing a Hare. The Hare, with the pursuer close behind, circled about him. He saw the Fisher several times, but could get no shot until the very moment when it sprang on the Hare; then he fired and killed both animals with the same charge.

Courage and Mental Twist

Its courage, too, is of a high order. In my early days, I more than once was told of Fishers—or Blackcats, as they were called in Ontario—which attacked boys and Dogs that had disturbed them. I never saw one of these attacks, but they were generally believed in; for all the hunters and trappers entertain great respect for the prowess of Fisher-Pekan.

Though a Marten in most things, this animal has many tricks in common with the Wolverine. According to Hardy, one of our best authorities on the species, Fishers often follow up a line of Sable traps to destroy them, stealing the bait, or eating any Sable caught in them. "Usually," says this experienced trapper, "they tear down the boxing, or take off the covering from the log traps, and reach in above the fall, and spring the trap. I have had a Fisher remove a piece of water-soaked wood from the top of a trap

[21] Mamm. Adir., p. 49.

[22] Q. N. A., I, p. 310.

set for him, which would weigh a great deal more than he would; then spring the trap."[23]

These details are corroborated by Doctor Merriam, but he adds that the Fisher is "said to be less objectionable than the Wolverine in one particular, i. e., it leaves the traps where it finds them, while the other blackleg often lugs them off, and hides them."[24]

Bernard R. Ross says: "In their habits, the Fishers resemble the Martens. Their food is much the same, but they do not seem to keep so generally in the woods. They are not so nocturnal in their wanderings as the Foxes. An old Fisher is nearly as great an infliction to a Marten trapper, as a Wolverine. It is an exceedingly powerful animal for its size, and will tear down the wooden traps with ease. Its regularity in visiting them is exemplary. In one quality it is, however, superior to the Wolverine, which is, that it leaves the sticks of the traps where they were planted: while the other beast, if it can discover nothing better to hide, will cache them some distance off."[25]

Speaking of his experiences with the grizzled old 18-pounder already mentioned, Ross says: "I caught it with difficulty. For about two weeks it had been infesting my Marten road, tearing down the traps and devouring the baits. So, resolved to destroy it, I made a strong wooden trap. It climbed up this, entered from above, and ate the meat. A gun was next set, but with no better success. It cut the line and ran off with the bone that was tied to the end of it. As a *dernier ressort*, I put a steel trap in the middle of the road, covered it carefully, and set a bait at some distance on each side. Into this it stumbled. From the size of its footprints, my impression all along was that it was a small Wolverine that was annoying me, and I was surprised to find it to be a Fisher. It showed good fight, hissed at me much like an enraged Cat, biting at the iron trap, and snapping at my legs."[26]

Another wolverinelike incident is contributed by Raymond S. Spears. He says: "Hardly less regular in their course than Burke in his, the Fishers sometimes changed runways to take in 6 or 8 traps along Burke's line. With aggravating regularity, the Fishers passed within a rod or two of traps set for their especial benefit. Sometimes they came to the very entrance of the cubby houses, and peered within at the bait and, doubtless, at the traps. Finding a Marten in a trap, the Fisher promptly kills and eats it; but the

[23] Shooting and Fishing, April 13, 1899, p. 526.

[24] Mamm. Adir., p. 48.

[25] Pop. Treatise, pp. 24–25.

[26] Pop. Treatise, p. 24.

15 Oct 1925
Late winter coat
Fall coat
Fisher in N.Y. Zool. Park 1925
Right fore foot. ¼ dry
Right hind foot ¼ from dry skin in Amer. Museum.

Plate LXXI.
Fisher details.

Fishers do not show quite the same sagacity as the Fox, which very carefully lifted one of Burke's traps out of its bed, and turned it upside down out of the way, after which it ate the bait."[27]

Coon-like Habit

In the Northern States and southern Canada, the ranges of the Coon and Fisher overlap. In this common strip, the Coon hunters quite often tree the Fisher; for the haunts and behaviour of the two animals are so much alike that the oldest hunters cannot tell from the race, or from the Dogs, which animal has been started.

Some interesting observations on this head are contributed by Bachman. He says:

"While residing in the northern part of our native State (New York), 35 years ago [about 1814], the hunters were in the habit of bringing us two or three specimens of this Marten in the course of a winter. They obtained them by following their tracks in the snow, when the animals had been out in quest of food on the previous night; thus tracing them to the hollow trees in which they were concealed, which they chopped down. They informed us that as a tree was falling, the Fisher would dart from the hollow, which was often 50 feet from the ground, and leap into the snow; when the Dogs usually seized and killed him, although not without a hard struggle, as the Fisher was infinitely more dangerous to their hounds than either the Gray or the Red-fox."[28]

On another occasion, Bachman and one of his men treed what they supposed was a Coon; but daylight coming, revealed it as a Fisher.

"As we were anxious to study its habits, we did not immediately shoot, but teased it by shaking some grapevines that had crept up nearly to the top of the tree.

"The animal not only became thoroughly frightened, but seemed furious; he leaped from branch to branch, showing his teeth, and growling at the same time; now and then, he ran halfway down the trunk of the tree, elevating his back in the manner of an angry Cat; and we every moment expected to see him leap off and fall among the Dogs. He was brought down after several discharges from the gun.

"He seemed extremely tenacious of life, and was game to the last, holding on to the nose of a Dog with a dying grasp."[29]

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[27] Forest & Stream, April 6, 1907, p. 530.

[28] Q. N. A., I, p. 312.

[29] Q. N. A., I, p. 310.

Speed

To the above account of the Fisher, Bachman adds: "The servant who had traced him, informed us that he appeared to have far less speed than a Fox, that he ran for 10 minutes through a swamp in a straight direction, and then took to a tree."[30]

This, however, was second-hand information, and Bachman continues: "The only opportunity that was ever afforded us of judging of the speed of the Fisher occurred near the Virginia Gray-Sulphur Springs, in 1839."

He was botanizing at Peter's Mountain when a Gray-squirrel darted by within 10 feet of him, and after it, a Fisher in pursuit. The Fisher seemed faster on the ground, but the Gray-squirrel took to a tree, and, leaping among the thinner branches that would not hold the Fisher's weight, escaped for a time, then leaped to the ground. The Fisher scrambled down the trunk. Bachman now interfered, and by pounding on his tin collecting box, scared the Fisher away and saved the Squirrel.

Strictly Nocturnal

Although it ranks among our most nocturnal animals, it is known to prowl occasionally by day. Many observers, including myself, have known it to travel or hunt when the sun was up. Nevertheless, these must be considered the exceptions. Prominent among these, is the case already noted, Bachman's account of the Fisher pursuing the Gray-squirrel. In comment, the famous old naturalist says: "This scene occurred in the morning of a warm day in the month of July, a proof that this species is not altogether nocturnal in its habits." In many Fox hunts detailed by his neighbours, Bachman says he "never heard of their having encountered a single Fisher in the daytime. . . . We were informed by the trappers that they caught the Fisher in their traps only by night."[31]

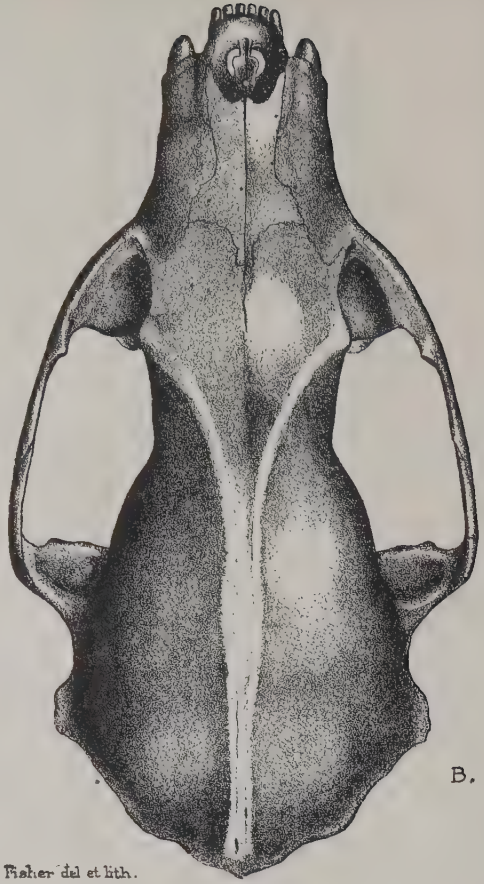
Trap-wise

The Fisher possesses many of the tricks and pure cussedness of the Wolverine. It is among the cleverest animals, but, like all, has its weak points, which the experienced trapper soon learns.

Mark Robinson writes me, May 13, 1925: "I have had some amusing experiences when trapping them for the Government. They can upset a trap the neatest of any animal I know, if it is covered; and they love to tear down trap-pens. The Indians make a hole at the ground in the side of

[30] Q. N. A., I, p. 310.

[31] Q. N. A., I, pp. 311–12.



B.

A

M. Horman Fisher del et lith.

Mintern Bros imp.

SKULLS OF MUSTELA PENNANTI. A. *aged*. B. *adult*.

Plate LXXII.

a hollow tree, the width of a trap, and shove the bait up inside the tree, leaving the trap uncovered. After several visits, the Fisher begins to use contempt for the trap. Result—he is caught."

When taken in a steel trap, the Pekan has frequently been known to foot itself—that is, gnaw off the imprisoned limb—realizing that it is better to go through a long life, halt and maimed, than to depart at once on four feet for the Happy Hunting Grounds. Our Maine trapper says: "I once caught one with only two legs; he had been trapped twice before, and lost a leg each time."[32]

In each and every department, we are impressed with the tremendous individual variation of the Fisher. In size, it varies from 4 to 18 pounds; in colour, no two of its skins are alike—it may be gray, black, yellow, or brown; Fisher skulls differ sufficiently, as we have seen, to seem like different genera; and its mentality is equally variant.

Raymond S. Spears, writing of his Adirondack trapper friend, Hy Burke, says: "Fishers, more than any other animals, were known to Burke. They aroused his enthusiasm, especially when he found where one had devoured a $7 Marten in his trap, near Salmon Lake. Of the score or more tracks of different Fishers which we saw, Burke recognized more than half as old acquaintances."[33]

Those who wish to read a colourful story of the woods, replete with remarkable insight and clear expression, are referred to this article. Would that space permitted its inclusion here.

Character Sketches

Here are three character sketches of the Pekan. The first is by Samuel Hearne, who wrote of these animals in 1795: "They are easily tamed and domesticated, are very fond of tea-leaves, have a pleasant musky smell, and are very playfull."[34]

Writing of the one captured by Spencer F. Baird, and from which Audubon made the drawing in "Quadrupeds," Bachman says: "We kept this individual alive for some days, feeding it on raw meat, pieces of chicken, and now and then a bird. It was voracious, and very spiteful, growling, snarling and spitting when approached."[35]

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[32] J. G. Rich, Bethel, Me., Forest & Stream, June 24, 1886, p. 426.

[33] Forest & Stream, April 6, 1907, p. 530.

[34] Journey, p. 377.

[35] Q. N. A., I, p. 312.

Our latest authority on Fisher, that is, Lew Aumock, of Rathdrum, Idaho, after telling of his tame Martens that used to climb all over him and nose in his pockets, adds:

"I have a Fisher here that I can pet like a Dog, and he never tries to bite me. . . ." But, "I do not let a Fisher climb upon my clothes, for they are so big and heavy, their long claws penetrate through my clothes."[36]

In *Forest & Stream*, Jan. 14, 1911, is a long account of a famous Adirondack Fisher, with the singular name of "Old Squaw Lake," after one of his resorts. This Fisher lost one of his feet and all of his foolishness some years ago, in a steel trap. His stump track is one of the identifying marks, and the record he has left of his war on trappers, is worthy of a volume. The writer of the story says some have followed Old Squaw Lake's tracks "just to see what the old cuss was up to," while others have followed, determined to add the fur to their winter catch. The story-seekers have been more successful.

Those who would revel in a richly detailed wild thing's life of quick events, are referred to this article. The old hero is supposed to be living yet, and it is to be hoped that someone who knew him, will assume the task of putting his picturesque story on record before it is forgotten.

Swimming

In spite of many statements that the species is quite unaquatic, I learn from George Linklater that he has often seen this animal swimming rivers and lakes; in fact, it does not hesitate to do so, when across seems the easiest way round.

The following, related to me by George Martin (of Paul Smith's, Adirondacks, N. Y.), illustrates at once the savageness of this animal, and its power as a swimmer:

In June, about 1870, Paul Smith was guiding a New York sportsman named S——. One night they went out to jack Deer on Spitfire Lake, near Paul Smith's hotel. They noticed a wake in the water and, thinking it was made by a Deer, gave chase. It proved to be a large Blackcat or Fisher, swimming the lake, here a mile wide. S—— insisted that he could catch the animal alive. When they came near, he seized it, and threw it into the boat. It attacked him savagely. He drew his hunting knife, but in his excitement, he did not notice that the sheath was still on it. With this, he fought the Blackcat, stabbing furiously, hitting the boat chiefly, and wondering at the toughness of the Cat. He was getting badly mauled,

[36]Raising Fisher, July, 1924, p. 55.

when Smith threw the beast out of the boat and killed it with his paddle. It was an old female. These animals are often known to swim rivers and lakes in the Adirondacks.

Storage, Diseases, Dung, and Track

The storage habit is well developed in this species. When it kills an animal, it eats as much as it needs, and then buries the rest. If you place a trap at the cache, you are sure to get your Fisher next day. This is well known among the Ottawa trappers, and a usual method of catching the Pekan.

It is not generally believed to store food for longer than one or two days, but MacFarlane quotes Colin Thompson as authority to show that for winter consumption, the Fishers provide quantities of rose hips in advance.[37]

Lew Aumock, of Rathdrum, Idaho, is one of the few fur-farmers who has successfully raised Fishers. His methods are set forth in the article on Marten, because he has handled and written of the two together; and the methods are the same for both.

Speaking of the Fisher's freedom from disease, he says: "Unlike the Fox, these animals are almost never sick under proper care. They do not seem to ever be bothered with worms, ear canker, distemper, mange, etc.; but they sure will have fleas and lice. They are not gluttonous like some other animals, and I have never known them to eat enough to make them sick. In the mountains, I have given them a whole grouse, and they would only eat the normal amount, and hide the rest for future use."[38]

The track of the Fisher is much like that of the Marten, but proportionately larger. On the ground it travels, as do most of the Weasels, by a succession of square-tracked jumps.

The dung differs chiefly in size from that of other Weasels.

Food—An Omnivorous Carnivore

Its food list is most comprehensive and includes every kind of bird, beast, fish, frog, or reptile that it can secure, as well as all manner of eggs and fruit, with nuts and seeds for variety; its choice staples being Hares, Squirrels, Mice, frogs, and fish when it can find them. Of the last, it is extremely fond, and yet it is not known to go a-fishing. It is said to catch and feed on its little cousin, the Marten, which is evidence of most amazing

[37] Mamm. N. W. T., 1905, p. 709.

[38] Raising Fisher, July, 1924, pp. 55–56.

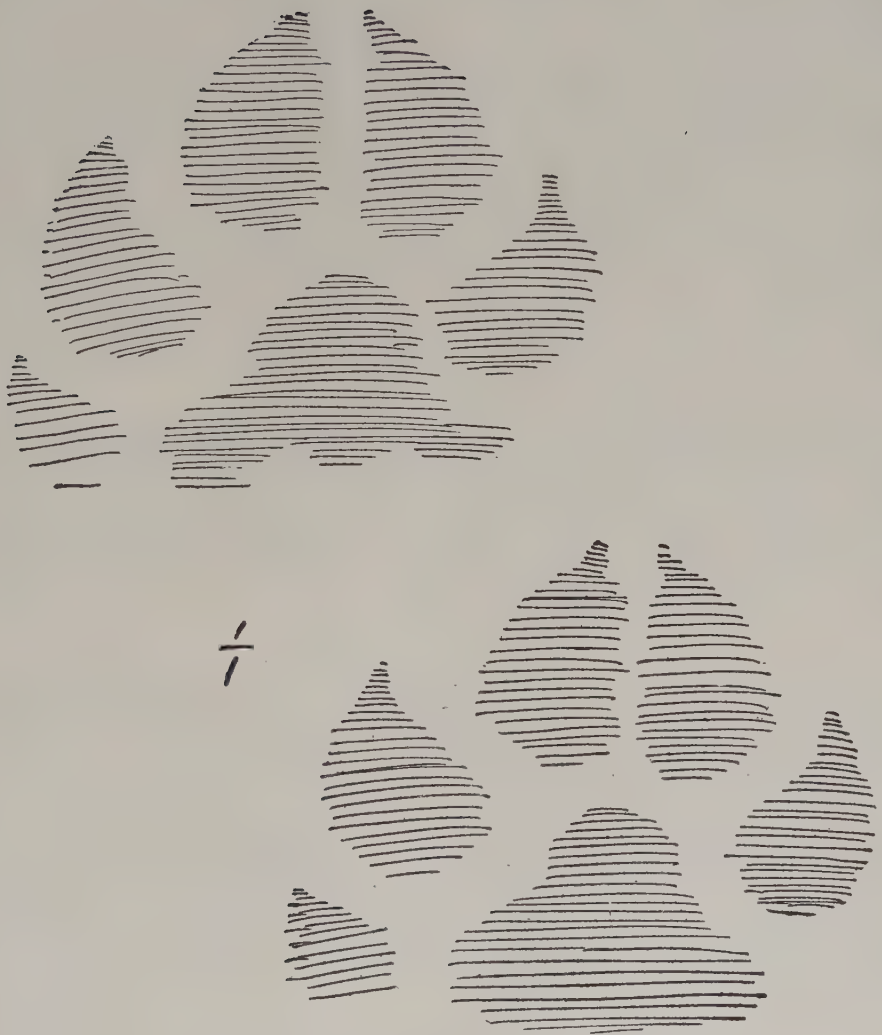

PLATE LXXIII.—TRACKS OF A LARGE FISHER
Bitterroot Mountains, Idaho, Sept. 6, 1902

agility. Bachman records the killing of an Ontario specimen thus: "A Fisher was shot by a hunter named Marsh, near Port Hope, who said it was up a tree, in close pursuit of a Pine Marten, which he also brought with it."[39]

Ross testifies that the Fisher, like the Marten, lives principally on Mice, thus bringing it back to the stand-by of all carnivorous races. But Mice are not always obtainable, and the valiant one may be subdued by grim hunger, and descend yet lower in the accepted scale of diet. George Crawford (the Indian guide, Mitigwab) tells me that in August, 1896, at Lake Kippewa, he saw a Fisher on the shore pulling down berries and eating them. They were, he said, small sweetish berries, in bunches with round leaves. They are like huckleberries, but black, not found except well up north. Dr. Coues is authority for the statement that it will stay its hunger with beechnuts if nothing better is at hand.[40]

Lew Aumock says: "It costs very little to feed these animals. In fact, no more than a couple of hens, and I know a good Marten or Fisher is worth about as much as a field full of hens. A big healthy Fisher will eat about half a pound of food a day. Both of these animals eat a great variety of food, such as cooked oatmeal, milk, bread and milk, most any kinds of fruit, cooked meats, and raw meat, etc."[41]

As Rabbit-Hunter

The favourite food of the Pekan appears to be the Rabbit or White Hare. What little migrating the species does is, no doubt, irregular wandering in search of woods or regions where the Hare abounds.

In pursuing these, it may either stalk them cat-fashion, or run them dog-fashion. Hardy says: "I have known one to catch a Rabbit by cutting across when the Rabbit circled. I once saw a Fisher which had driven a Rabbit into the Alleguash River. The Rabbit had swum to a gravel bed in the middle of the river, and sat crouched down, while the Fisher kept racing up and down on the shore, but did not take the water where the tracks ended, as a hound would have done."[42]

A case of the kind came under my notice at the Lake of the Woods, as already noted, and the following incident gives a graphic picture of how it is done.[43]

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[39] Q. N. A., I, p. 313.

[40] Fur-bearing, p. 70.

[41] Raising Fisher, July, 1924, p. 55.

[42] Shooting and Fishing, April 13, 1899, p. 526.

[43] J. G. Rich, Bethel, Me., Forest & Stream, Jan. 14, 1886, p. 484.

"I once saw a Hare come out of the woods on to [the ice of] Lake Mollychunckemunk, running at great speed, and, immediately after, a Fisher on his track. They followed down the lake about a mile when the Hare commenced to circle, quite large at first, and continually making the circle smaller; the Fisher always keeping inside the circle of the Hare, and so gaining quite a distance at every round; or rather, not having to run so fast to keep the Hare on his speed, the Fisher seemed to take it very leisurely, until the circle became so small as to end at a point, and the Fisher was there as soon as the Hare, and made short work of him. I had followed down the lake as fast as I could, in hopes of getting a shot, and so had an excellent chance to see the whole manœuvre, but the Fisher saw me, dragged his prey ashore, and fled into the woods."

The Cutthroat of the Woods

Paul Fountain offers some vivid details that illustrate the creature's speed and prowess in capturing its food, as well as its broad views on the subject. He says it spends "much of its time on the ground in damp, swampy situations. Unlike the Mink, it does not seem to often frequent running water, but prowls about stagnant pools and small, shallow lakes preying on reptiles, fresh-water molluscs and crustaceans, and small fish, which it beats out of the water with its fore paws in the manner of a Cat. It also robs other animals of fish which they have captured, and I have seen one eating the refuse which had been ejected from the nest of an osprey. All and every small creature that it succeeds in surprising, bird or mammal, is also devoured by it, and even other *Mustela;* but in this, it is not singular, for I have seen a Marten devour an Ermine, and have reason to think that when these little animals fight together, which they sometimes do, for they are all fierce and bloodthirsty, the conquerors devour the vanquished.

"I have also seen the Tree-fox [Fisher] and the common Otter (*Lutra canadensis*) fight together, the object of the Fox being to obtain the fish captured by the Otter. In this case, the fight was not fatal to either combatant; for the Otter, after a time, returned to the water, taking its fish with it."[44]

A Killer of Fox, Coon, and Lynx

The dietary of the Fisher expands on investigation. Linklater and many others of my trapper friends say they have often heard of Foxes killed by this animal. It runs the Fox, like a hound, following all day, till the latter gets tired and takes refuge in a hole, where it is easily dispatched.

[44] Great Northwest, 1904, pp. 104–05.

Half as heavy again as the Fox, and twice as much of a fighter, is the common Raccoon, yet it stands in awe of the Fisher.

Lewis and Clark, who refer to the Fisher as "Black Fox," say that "these animals . . . bound from tree to tree in pursuit of the Squirrel or Raccoon, their most usual food."[45]

Doctor Coues says: "It may not be generally known that the Pekan successfully assaults an animal as large as the Raccoon; indeed, that the abundance of the latter in some districts depends in a measure upon the rarity of the former. The following letter, addressed to Professor Baird, in 1857, by Peter Reid, of Washington Co., N. Y., sufficiently attests these facts:

"Raccoons are more numerous here now than they were at the first settlement of the country, or for some time subsequent. Thirty years ago, they were so seldom found that many boys 15 or 18 years old, had scarcely seen one. Before the increase of their numbers, I once witnessed a circumstance that satisfied my mind on this score. Whilst hunting, early one winter, I found the carcass of a freshly killed Sheep, and by the tracks around it in the light snow, perceived that a Fisher had surprised a Raccoon at a feast. A hard chase had ensued, the Raccoon tacking at full speed to avoid his pursuer, the Fisher outrunning, and continually confronting his intended victim. I saw where at length the Fisher had made an assault, and where a bloody contest had evidently ensued. The Raccoon, worsted in the encounter, had again broken away, and the chase was resumed, but with diminished energy on the part of the Raccoon; the animal had been soon overtaken again, and a still more desperate encounter had taken place. The Coon had failed fast, and it had at length become merely a running fight, when both animals had entered a swamp where it was impossible for me to trace them further; but I have no doubt the Coon was killed. I have witnessed similar engagements between the Mink and Muskrat, the Weasel and the Houserat, always ending in the death of the assaulted. The Fisher has been nearly extinct in these parts for about 25 years, and this, to my mind, accounts for the great increase in numbers of the Raccoon."[46]

Lewis and Clark, as we have seen, ascribe a similar habit to the Fisher of Oregon; and, as set forth by Bachman, this doughty desperado can sometimes fight off a number of Dogs. Yet one step further: The Indians say that a Fisher will kill a Lynx. Linklater, my principal informant on

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[45] Exped. 1804–06, II, Chap. VII, pp. 178–79, Hosmer Edition.

[46] Fur-bearing, pp. 73–74.

the subject, never saw a case, but was inclined to believe it, as he had had much experience with both animals, and knew their relative merits.

As a Deer-killer

Now, since the Pekan's prowess is demonstrated, and its fighting fame proclaimed, we are prepared for the following from the pen of Manly Hardy: "In spite of their small size and light weight, Fishers not only kill Deer, but can and do kill those of the largest size. When I first heard of this I doubted it, but know now that they often do it. A year ago last fall, my old friend, Louis Ketcham, was following the track of a large buck near the head of Nahmakanta Lake. In going along the side of a high granite ledge he saw where the buck had fallen, and there was blood on the snow. After stumbling along a few rods, it had fallen again, and there was more blood. This was repeated several times, and then he saw where the buck had struck a Fisher which had been clinging to its neck and biting it, and had knocked it several feet to one side. The Fisher was evidently badly hurt, as Louis said it dragged its hind legs, making a track in the snow like an Otter, and had crawled into a crack in the ledge. On going back, he found that the Fisher had been on top of the ledge, where the Deer path led along close to it, and had sprung down upon the Deer, and was trying to bite the jugular vein. I have known of instances where they have been successful in doing this."[47]

The Fisher and the Dog

There is in the bravest wild animals, a certain shyness, a dislike of scene and uproar, that leads them to avoid a noisy attack, even when not afraid of it. This noble reserve explains why Cougar, Wildcat, and many others of undoubted courage, will "tree" before the onset of one or two noisy curs, even though later, they may come down and scatter the loud-mouthed mob. Manly Hardy's remarks on the present animal are in line. He says: "While a Fisher can be treed by any small Dog, the same as a Lynx or a Wildcat, there are very few Dogs that have much business with a Fisher if he has a fair chance. An Indian friend once told me that he was hunting Moose and had with him a very large bulldog which he thought could whip anything of his size. While looking for Moose, they struck a fresh Fisher track and followed it till it went into a hollow log. As the entrance was large he sent the Dog in, and setting his gun against a tree, stood at the mouth of the log listening to the fight going on inside. He was expecting to see the Dog back out with the Fisher in his mouth, but

[47] Shooting and Fishing, April 13, 1899, p. 526.

in a few minutes the Dog came out head first, with the Fisher following and chasing him. The Fisher jumped over the Dog, and the Dog ran away so thoroughly whipped that he could not be induced to take the track again. He said that the Dog's head was all bitten and scratched up."[48]

A Terror to the Quill-pig

What he does when he meets a Skunk—when fighting valour is confronted with poison gas—no man has yet seen and put in print. But his battles with the knight of many spears are abundantly on record.

As far back as 1829, Richardson wrote of the Pekan: "Its favourite food is the Canada Porcupine, which it kills by biting on the belly."[49]

Every Northern naturalist since has borne similar testimony. Hardy says: "Their food consists of Porcupines largely. . . . It seems to swallow the quills of Porcupines without any injury. I have examined many hundreds of Fisher skins where there were quills lying flat against the skin usually either on the back of neck, or lower part of the back, but I never saw any signs of their causing any sores or suppuration, as they do in a Dog. While I had skins of Fox, Raccoon, and Wildcats, which have been picked up dead, with their necks just filled with Porcupine quills, which evidently had caused their death, I have never seen a quill sticking in a Fisher; and the same is true of Bears, which also eat a great many Porcupines. In eating Porcupines, they do just as Bears do, turn them over on their backs, and eat out most of the meat, leaving the skin nearly entire."[50]

Mark Robinson says that in Algonquin Park, "I have often come upon Porcupine killed by Fisher. The quills never appear to go through the second layer of skin. This I found by removing the pelt from different Fishers."[51]

Abundant corroboration is found in "Mammals of the Adirondacks" (pp. 49–50). "I was informed," says Merriam, "both by an agent of the Hudson's Bay Company and by the trappers themselves, that Porcupines constitute a large and important element in the food supply of the Pekan. Nap. A. Comeau, of Godbout, who secured for me a large and handsome male of this species, tells me that its intestine contained hundreds of Porcupine quills, arranged in clusters, like so many packages of needles, throughout its length. In no case had a single quill penetrated the mucous lining of the intestine,

[48] Forest & Stream, June 4, 1910, pp. 888–89.

[49] F. B. A., I, p. 53.

[50] Shooting and Fishing, April 13, 1899, p. 526.

[51] Letter, May 13, 1925.

but they were apparently passing along its interior as smoothly and surely as if within a tube of glass or metal.

"Mr. Comeau could not discover a quill in any of the abdominal viscera, or anywhere in the abdominal cavity, excepting as above stated. A great many, however, were found imbedded in the muscles of the head, chest, and back and legs; and it was remarked that their presence gave rise to no irritation, no products of inflammation being discovered in their vicinity. In examining the partially cleaned skeleton of this specimen, I still find some of the quills in the deep muscles and ligaments about the joints. A knee, in particular, shows several in its immediate neighbourhood. One is deeply imbedded in the dense ligament alongside the patella; three lie parallel to and close against the tibia, and two can be seen between it and the fibula.

"It is probable that all of these quills entered the body of the animal while engaged in killing and devouring the Porcupine, for those swallowed seemed to have caused no trouble after having fairly entered the alimentary canal. Therefore, there remains no question whatever that the Fisher feeds upon the Porcupine; but I do not agree with Corporal Warfield in the belief that the quills often prove fatal to it."

In his own book recently published, Napoleon A. Comeau has given us new and valuable light on the relationship between Fisher and Porcupine. He says of the Fisher: "His natural food is meat, and, when he could get it, chiefly that of the Porcupine, of which he is the most deadly enemy. . . .

"Going through the woods one day, I came on a Fisher that had killed 3 Porcupine, only a small part of each of which he had eaten, and that near the throat. He was hard at work on the third one when I shot him. . . .

"A very strange thing is that the Porcupine quills do not seem to affect this animal at all. Some years after I began trapping, I caught a large Fisher—a male—that I am sure had over 200 quills in its body, without apparently suffering any inconvenience from them. I examined it carefully—it appeared so extraordinary—for signs of pus or swelling, but there was none. The animal was fat and in fine condition. I was not satisfied with this particular case, but resolved to continue this examination with every specimen I should get hold of. Since that time, I have trapped and shot about 40 Fishers, every one of which had quills in the body, but with no bad effect."[52]

Comeau further states that prior to 1865, Porcupines so abounded in the Gaspé country, that the natives counted on them as an important food supply, some Indians killing 150 to 200 in a season, without apparently

[52]Life and Sport on the North Shore, 1909, pp. 80–84.

PLATE LXXIV.—LIFE STUDIES OF FISHER
The old specimens from Maine; the young from near Winnipeg

reducing the number. In these days, the Fisher was practically unknown. Then a great immigration of Fishers took place, and in two years the Porcupine was nearly exterminated.

"During these two years, every trapper got a few Fisher, some getting as many as 10 or 12 in one season. I myself trapped 8 one winter in this immediate vicinity, although I could only devote a small portion of my time to trapping. This abundance of Fisher lasted only 3 seasons; after that, they disappeared. Since then, only an accidental one is trapped."[53]

George Linklater, for many years a chief trader for the Hudson's Bay Company at different posts, was my guide on the Upper Ottawa in 1904. He has handled hundreds of Fisher pelts, but *never saw one without some Porcupine quills in it* The skin is discounted in proportion to the quill damage it shows. He never saw but one Fisher that was seemingly hurt by a Porcupine. He found this—an old one—eating at a Deer carcass. It could scarcely crawl, and was full of quills. He thinks it would have died in a few days. This was in December.

Another of my guides in the Northern woods, Chief Mitigwab, tells me that he never saw a Fisher skin without many Porcupine quills in it, but they do no harm, never fester, and always work out. He has seen them dropping out of Fishers' pelts, but never saw them in the flesh; the back is usually full. Then, adding a final and truly Indian touch, he said: "Fisher's liver given to a Dog will force all the quills out of him."

References for Fisher

1795—Journey to the Northern Ocean, by Samuel Hearne.
1829—Fauna Boreali Americana, by Dr. John Richardson.
1849—Quadrupeds of North America, by Audubon & Bachman, I.
1861—A Popular Treatise on the Fur-bearing Animals of the Mackenzie's River District, by B. R. Ross, *Can. Nat. & Geol.*, VI, pp. 5-36.
1877—Fur-bearing Animals, by Elliot Coues.
1884—Mammals of the Adirondacks, by C. Hart Merriam.
1924—Raising Fisher and Marten, by Lew Aumock, *Hunter-Trader-Trapper*, June and July.

[53] Life and Sport on the North Shore, 1909, pp. 80–84.

LIFE XXXIII—THE MARTEN

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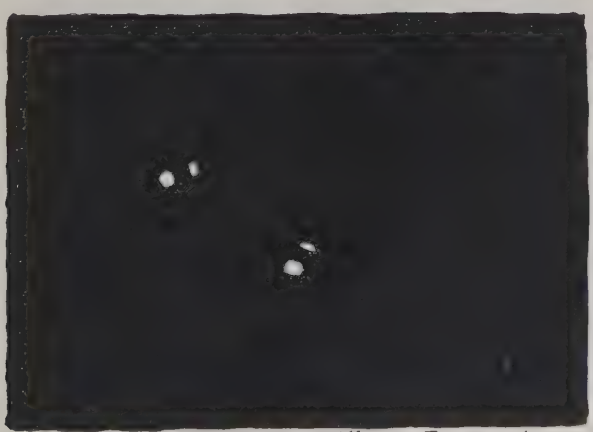

Two Marten fighting over a Unio although Rana and Cambarus are abundant

The Marten, Pine Marten, Pine Martin, American Marten, Marten Cat, Pussy Marten, Hudson's Bay Sable, American Sable, Saple

Martes americana (Turton)

(L. *Martes*, a Marten; *americana*, American)

Mustela americana Turton, 1806, Linnæus, Syst. Nat., I, p. 60.
Martes americana americana Miller, 1912, Nor. Amer. Land Mamm., p. 92.

Type Locality—Eastern North America.

French Canadian, *la Marte; la Fouine.*
Cree and Montagnais, *Wah-pe-stan'.*
Ojibway and Sauteaux, *Wah-be-jay'-she.*
Chipewyan, *Tha.*
Yankton Sioux, *Mah-ha-pah-skay-chah.*

The genus *Martes* (Pinel, 1792), is much like *Putorius* and *Mustela;* but consists of larger animals with arboreal habits. They have bushier tails that are half as long as the body; large ears. They do *not* turn white in winter; that is, their winter coat is not very different in colour from that of summer. The dentition differs from that of *Putorius* chiefly in having 4 more premolars, and is as follows:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{4-4}{4-4}\text{; mol. } \frac{1-1}{2-2} = 38$$

In addition to the generic characters, the Marten has:

Size. Total length, about 25 in. (635 mm.); tail, 8 in. (203 mm.); hind foot, $3\frac{3}{4}$ in. (95 mm.).

Weight. The *sierrae* form is given at 26 to 33 oz.[1] "A full-grown Marten weighs about 4 lbs."[2]

Colour. Rich dark yellowish brown, shaded into blackish on the tail and legs, and into gray on the head; with ear linings of dull whitish, and a large irregular patch of pale buff or orange on the throat and breast. But the general colour ranges in any given locality from golden yellow to blackish

[1] Animal Life in the Yosemite, by Grinnell & Storer, 1924, p. 82.

[2] Thompson, Nat. Hist. Vermont, 1853, p. 33.

umber, and the patch on the throat from orange to white. The claws are white.

"The rocky and mountainous, but woody district of the Nipigon, on the north side of Lake Superior, has long been noted for its black and valuable Marten-skins."[3]

"Those from Newfoundland and Labrador are much finer, darker in colour, and more lustrous in pelage than our own. They have pale faces."[4]

Martin Hunter, the old H. B. Co. fur-trader, speaking of the Marten on Anticosti Island (he calls it Anticosta), says: "The Martens on this island are peculiar and distinct in this manner, that almost without exception the fore paws and the end of the tail are tipped with white hair."[5]

When seen in the trees, the Marten gives the impression of a large dark Squirrel, with white ears and a yellow throat; when on the ground, it looks like a dark-coloured young Fox.

Its grand distinctive label is the blazing patch of yellow, framed in dark brown, which ornaments its chin and throat. By this ye may know the Marten.

Races

The following forms have been recognized:

americana Turton, the typical form. T. l., Eastern North America.

abieticola Preble, differs from *americana* chiefly in being much larger, and in having heavier teeth. T. l., Cumberland House, Sask.

abietinoides Gray, a dark brown race. T. l., Western slope of Rocky Mts., between Kicking Horse Pass and the Columbia River.

brumalis Bangs, a large dark race. T. l., Okkak, Labrador.

actuosa Osgood, a large gray race. T. l., Fort Yukon, Alaska.

kenaiensis Elliott, a small pale race, without throat patch. T. l., Kenai Peninsula, Alaska.

atrata Bangs, large and very dark, "like a dark coloured Mink." T. l., Bay St. George, Newfoundland.

caurina Merriam, like *americana*, but with broader, shorter skull, and throat patch orange instead of yellow or white. General colour, brown. T. l., Near Gray's Harbour, Chehalis Co., Wash.

[3] F. B. A., I, p. 51.

[4] Gilpin, Mamm. Nova Scotia, 1866, pp. 11–12.

[5] Can. Wilds, p. 132.

origenes Rhoads, like *caurina*, but paler brown; ear edges and cheeks not whitish. T. l., Marvine Lodge, Garfield Co., Colo.

sierrae Grinnell & Storer, much like *caurina* but paler. T. l., head of Lyell Canyon, Yosemite Nat. Park, Calif.

nesophila Osgood, like *caurina*, but larger. T. l., Massett, Graham Island, Queen Charlotte Ids., B. C.

Some consider the last 4 to be races of one species, *caurina*, distinct from the *americana* group.

Range and Records

In Canada and Northward. In one form or another the species ranges from ocean to ocean wherever there are heavy pine or fir forests, in the Canadian and Pacific Faunas; and northward to the edge of the timber and southward along the Alleghanies, the Rockies and the Sierras, keeping very exactly to the Canadian faunal region.

Newfoundland. "Still common in various parts of the island, but from the increasing, or at any rate, present value of the fur, is annually becoming scarcer."[6]

"The Newfoundland Marten, *Martes atrata* (Bangs), is decidedly a scarce animal and is peculiar to the island."[7]

Anticosti. "Marten occur on Anticosti. Very fine and large."[8]

Vancouver Island. "Apparently fairly common in the higher mountains, but in summer at least not found in the valleys and lowlands."[9]

Queen Charlotte Islands. "The Haidas trap more or less for Martens every winter, but the animal is evidently not abundant, for Mr. Tennant's annual receipts seldom exceed 40 skins."[10]

Colorado. When I hunted and camped in Routt and Rio Blanco Counties, Colo., in 1901, I found the Marten generally distributed but not common.

"In Colorado it is probably found all through the heavy spruce forests of the main range, and those to the West. We have no information as to any records of its occurrence in the Pike's Peak Range. In some localities, it is fairly common."[11]

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[6] Henry Reeks, Mamm. Newf., Zoologist, March, 1870, p. 2037.

[7] Bangs, Land Mamm. Newf., Bull. Mus. Comp. Zool., July, 1913, p. 511.

[8] W. Couper, Forest & Stream, June 14, 1877, p. 300.

[9] Harry S. Swarth, Birds & Mammals from Vancouver Island, Univ. Calif., 1912, p. 103.

[10] Osgood, N. A. F., 21, 1901, pp. 33–34.

[11] E. R. Warren, Mamm. Colo., 1910, p. 202.

MAP IX.—RANGE OF THE MARTEN AND ITS KIN

By E. T. Seton, with assistance of the Biological Survey

Extirpated in the pale-tinted area of southern Canada and the Northern States in the East.

J. A. Allen considers it common in Park Co.[12]

New Mexico. In the Wheeler Survey Report, V, Zool., by Dr. H. C. Yarrow, 1875, p. 61, is the following: "Specimen No. 398, *Mustela americana*, locality Taos, N. Mex., date Aug., 1874, Coll. Dr. H. C. Yarrow, skin. Particularly interesting on account of the locality, which is the southernmost on record thus far for this species."

California. "Common in parts of the dense forests of Shasta, particularly on the east side, where many are caught every winter by trappers."[13]

"The Pine Marten is a common inhabitant of the pineries of northern California."[14]

"Pacific Martens are found along the coast from San Francisco northward to Puget Sound. Martens probably of this species are found in the Sierra Nevada."[15]

"There are few places where Martens are common in these days, but they are to be found in fair numbers in this region [Mono Co.]. The trappers get them, and I caught a pair, August 7 and 9, 1914, in steel traps set at Rat nests in the middle of an extensive rock slide."[16]

For details of records in other parts of its range, we give the following:

Labrador (Bangs, Mamm. Lab., *Amer. Nat.*, July, 1898, p. 502); Nova Scotia (Gilpin, Mamm. N. S., *Trans. N. S. Inst. Nat. Sci.*, Nov. 5, 1866, pp. 11–12); New Brunswick (A. L. Adams, Field & Forest Rambles, p. 295); Ontario (Gapper, Quads. Upper Can., *Zool. Journ.*, Feb.–June, 1830, p. 203; also, in my early days in the '70's, Martens were trapped regularly in the region between Lake Simcoe and the Ottawa River. South of this line they were exceedingly rare. Dr. W. Brodie told me that he remembered seeing it once in the woods of Whitchurch 10 miles north of Toronto. I find no records whatever for the Ontario Peninsula. Toward Lake Nipissing it has always been common; also, "Marten are plentiful in some parts of the [Algonquin] Park, according to the supply of food, Rabbits, Squirrels, grouse, Muskrats. They are very hard on the birds, keeping up a steady warfare on the nests and young birds. They may be plentiful in one location one year, and none there the next. This depends on food.")[17] Manitoba (It is found in all the northwestern half of the Province, and on the Porcupine, Duck and Riding Mts. J. S. Charleson got a specimen from the Carberry

[12]Coues, Fur-bearers, p. 93.

[13]Merriam, Mamm. Mt. Shasta, N. A. F., 16, 1899, p. 106.

[14]C. H. Townsend, Nat. Hist. Calif., Proc. U. S. Nat. Mus., 1887, p. 188.

[15]Frank Stephens, Calif. Mamm., 1906, p. 245.

[16]A. B. Howell, Mamm. Calif., Journ. Mamm., Feb., 1924, p. 28.

[17]Mark Robinson, Ranger.

spruce woods, and D. Nicholson heard of one or two in the Pembina Mt. in 1879 but not since, nor was it ever common there; also A. Henry, Journal, pp. 155, 452). Saskatchewan and Alberta (The northern or wooded halves of these two provinces have always been famous for the Martens; in the southern or prairie sections they are unknown). British Columbia (Hollister, Mamm. Mt. Robson, *Can. Alp. Journ.*, 1912, p. 12); Mackenzie River Valley (B. R. Ross, Mamm. Mack., 1861, p. 27); Alaska (L. M. Turner, Contrib. to Nat. Hist. Alaska, p. 208; also Nelson, Alaska, p. 244); Maine (Famous for the abundance and quality of its Martens. Of the former, the many quotations from Manly Hardy are evidence. The quality is high as ever, but the Martens have become very scarce, and are rarely seen now in the southern part of the state). New Hampshire (C. F. Jackson, Notes on N. H. Mamm., *Journ. Mamm.*, Feb., 1922, p. 15); Vermont (Z. Thompson, Nat. Hist. Vt., p. 32); Massachusetts (Emmons, Quads. Mass., p. 41); New York (DeKay, Nat. Hist. N. Y., p. 33; also, Merriam, Mamm. Adir., p. 52); Pennsylvania, New Jersey, and southward (Rhoads, Mamm. Pa. & N. J., p. 176; also, Bachman, Q. N. A., III, p. 179); Ohio (not listed in Brayton's Mamm. Ohio); Indiana (not listed in Hahn's Mamm. Mitchell, Ind.); Michigan (Wood, Mich. Mamm., p. 10; also, Dice & Sherman, Mamm. Gogebic and Ontonagon Cos., Mich., p. 27); Illinois (Kennicott Quads. Ill., p. 243; also, Cory, Quads. Ill. & Wis., p. 383); Montana (Bailey, Wild Animals Glacier Nat. Park, pp. 88–89); Idaho (Merriam, N. A. F., 5, p. 84); Wyoming (When I was living in Yellowstone Park, during the summer of 1897, I found the Marten of general distribution but not common. In 1912 and 1914, I found it in about the same condition. When camped in Jackson's Hole in the September and October of 1898, I found the Marten common). Washington (Baird, Pac. R. R. Rept., VIII); Oregon (Baird, as above, p. 158).

Haunts

Throughout the vast area indicated on the map, the Marten is at home where there is a stretch of heavy pine or spruce forest. This is one of the few species that really prefer the glooms of firs. You look for it in vain on open prairies, in willow swamps, in dense undergrowth, on open marshes, or mountaintops above timber line. It is a big-tree Cat at all times, and hates even an open glade. Its highways are mighty limbs of the best big evergreens, and when these highways are broken by adverse soils below, or by the settler's axe, the Marten shuns the place. Even the borderland is discordant to the Marten tribe, and the merest beginning of a clearing about the settler's home is enough to drive it away. Consequently, it has always been one of the first to retreat before civilization.

Some animals completely change their haunts as well as their range with the season. The Marten, however, adheres to his one first choice. He makes no true migration, and the changes in his whereabouts are only such as are dictated by food possibilities.

Writing of the Marten as he saw it in the Sierra, H. S. Peterson says: "The Pine Marten is a great summer rambler, but when seen in summer, no calculation can be made that he may be found in the same locality in mid-winter. Hence, a cruise is necessary to look up his winter range. When this is found, no ingenuity of trapping is required, as almost any trap, properly set, will take him.

"It is not generally known, except by the wise trapper, that the north slope of a ridge in winter time, is the calmest, and is preferred by the Marten because here huddle the grouse and other feathered game, protected from the prevailing southeast and southwest storms.

. . . . . .

"In the fall, the Pine Marten is much abroad in the daytime. This is, no doubt, owing to climatic changes, or the migratory instinct so common among all the Weasel tribe, and to which much of their restlessness must be attributed.

"Their favourite haunt is among the tangle of down timber caused by a snow-slide. . . . Not alone the grouse, but all the rest of the feathered tribe seek now the shelter afforded by the brakes and tangles of this labyrinthine retreat. These are the feathered grubstake of what natural history sharps call *Mustela americana*, the American Sable or Pine Marten."[18]

An effort to adapt itself to changes of conditions, is seen in the following by Raymond S. Spears, the well-known naturalist. Writing from Little Falls, N. Y., he says: "Lumbering operations have driven the Marten hither and yon, and it is doubtful whether they are increasing or not. They are green timber animals; and the destruction of the spruce, hemlock, and pine, bothers them more than it bothers other animals. One trapper noted that they cross valleys now more than ever, and that traps along brooks, intended for Mink, caught Marten as often as Mink."[19]

Home Range

I have no evidence on the home range of the individual Marten, beyond the opinion of trappers that it will roam a mile or more around its headquarters. George Linklater thinks that two square miles in Algoma, will

[18] Forest & Stream, April 30, 1910, p. 694.

[19] Forest & Stream, April 23, 1910, p. 656.

cover the usual beat. When food is scarce, however, it will travel for many miles in search of better hunting.

Numbers

To form an idea of the Marten population, I have consulted all authorities and available books, as well as trappers and fur-traders.

Professor H. Y. Hind, in his "Exploration of Labrador," 1863, I, pp. 47–48, says that an Indian who there took only 22 Martens all winter, on a 30-mile line of traps, was thought to have had very bad luck. In this district, Moisie River, Martens were scarce. The same hunter, in a well-stocked region, the Manicouagan Valley, caught 57 Martens in one month. As they were of good quality, and brought the highest price then current ($5), he was now considered successful.

Roderick MacFarlane writes me a personal experience during a season when Martens abounded in the North:

"Many years ago," says he, "when I had charge of Fort Good Hope, Mackenzie River, I made a 15-mile line of perhaps 100 deadfall traps, baiting them with the heads of smoked fresh-water herring. A few days later, I went to the end of the track, and on my way out, I found quite a number of whiskey-jacks taken, and one or two Squirrels, while 8 Martens were secured dead. Most of the baits had, however, been removed by Mice and birds. On my way out, I placed new baits in all of the traps, and 4 more Martens were found in them on my way back to the post. They were freshly taken. On my next visit, a *cussed* Wolverine had preceded us; the few Martens secured were stolen by him, and the entire line demolished. The brute kept around most of the winter, so that my total catch of the season was only about 60 skins. Had he kept away, I might have secured between 100 and 200 skins.

"I have also known a *Saulteaux* prisoner from Lac la Pluie, banished to Mackenzie River, for some crime in the fifties of the last century, capture 39 Martens out of 40 deadfall traps made by him on a round of a dozen miles, just as the snow fell. That was what he got on his first visit, and the fortieth trap showed that a Marten was trapped, but succeeded in getting away.

"Two hundred Marten skins was the hunt (average) of the best Indian hunters at Fort Liard, for several years when these animals were abundant in the early fifties. For output 1853, the late William F. Lane (an Irishman) traded 12,000 skins of the Marten at Liard, the best trade ever known there. The next year, under Robert Campbell, it yielded over 10,000; and some 2,000 less the next. During the decades of the forties and fifties, the Mac-

kenzie River Marten trade was by far the best obtained before or since. In years of scarcity, the trade has not averaged a fifth of those of plenty."

In the fall of 1859, Manly Hardy, the well-known hunter-naturalist of Brewer, Maine, went with a partner, Rufus B. Philbrook, on a trapping venture in the vicinity of Caucomogomoc Lake, Northern Maine. They went into camp, Oct. 7th.[20]

After a month, Hardy returned. His partner continued 3 weeks alone. Their "total catch was 4 Bears, 3 Lynx, 2 Otter, 4 Fisher, about 50 Sable, 35 Mink, 7 Beavers, and 75 Muskrats."[21]

From these and many parallel facts, I conclude that 200 Martens, taken in one winter on a 25-mile line of traps, would be a large haul; more, indeed, than the best Marten country could stand. A few years at this rate, and the region would be trapped out. The area involved would be a strip 2 or 3 miles wide. In other words, if 4 Martens were killed in 2 or 3 successive years on each square mile of a region that was thickly populated by the species, it would probably exterminate them in that locality. From which we may argue that 6 Martens to the square mile would be a high rate of population.

Fluctuation of Numbers

One of the interesting unsolved problems of animal life, and especially of Marten life, is the periodic rise and fall of the population. The Marten continue to increase for 7 or 8 years, until they seem 10 times as numerous as at the beginning of the period; then they decline quickly for 1 or 2 years, until again near zero.

This fluctuation must be due either to migration, epidemic, starvation, destruction by trappers, or a combination of these.

J. K. MacDonald, of Winnipeg, after 35 years' experience as a Chief Trader for the Hudson's Bay Company, maintains that migration is the cause. He writes: "I think there is sufficient proof that they do migrate. A question annually put to the Indians returned from the woods in summer or fall was, 'What signs of Marten have you seen?' and where but few of these animals may have been seen in the previous winter, I would be told, 'They are travelling north, south, east, or west,' as the case might be; and so definite was their knowledge that these Indians would go that winter to head off the wanderers. They never failed to come in contact with them. These movements of large bodies of the Marten go on in summer and till severe winter sets in, beginning again in March and continuing, as far as

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[20] Forest & Stream, May 7, 1910, p. 728.

[21] Manly Hardy, A Fall Hunt in Maine, VI, Forest & Stream, June 11, 1910, p. 929.

the males are concerned, till such time as the snow is not fit to travel on; and then on again during the summer. It is accepted as a matter beyond cavil, by all Northerners—that is, Hudson Bay hunters—that the Hare, Lynx, and Marten do migrate, and the fluctuation in their numbers is not considered to be caused by epidemics—save in the case of the Hare.

"The Rabbit is always numerous where Lynx and Marten are plentiful, and it is looked on as a *sine qua non* by hunters and traders, that it is following up the Rabbit or Hare that causes these migrations—that the migration is, in fact, quest for food."

Bernard Ross comes to a different conclusion. He says: "The periodical disappearance of this species is very remarkable. It occurs in decades, or thereabouts, with wonderful regularity, and it is quite unknown what becomes of them. They are not found dead. The failure extends throughout Hudson Bay Territory at the same time; and there is no tract or region to which they can migrate where we have not posts or into which our hunters have not penetrated."[22]

This seems to prove that they are not migratory; and the aggregate fur returns of the whole country afford conclusive evidence that though there may be some local migrations, the fluctuations are general, and that the whole Marten population increases and decreases with fair regularity, in periods of 8 to 10 years. MacFarlane thinks that there is some migration, but that other things enter into the problem. He believes that the abundance of the Marten is a direct result of abundance of Rabbits; and when the Rabbits fail, many Martens die, others migrate. His remarks are as follows:

"The scarcity and abundance of Marten and Lynx depend upon the scarcity and abundance of the Rabbit or Hare. Many Indians assert that Marten and Lynx (of which, by the way, not a few die off, especially when Hares are scarce) migrate, as well as most of the Rabbits which are not snared, etc., by the natives, or carried off by disease, and as they are not uniformly abundant all over the five territories (apart from the fact that they suddenly appear in localities where they had previously for a season or so been conspicuous by their absence), there seems to be good ground for the supposition that they migrate. There are other circumstances also, such as an unfavourable season for breeding, a scarcity of the required food, and the destruction by fire of the extensive areas of forest, which would, of course, more or less affect the abundance of these and other species of animals in certain localities."[23]

[22] Pop. Treatise, p. 28.

[23] Letter.

Moreover, he does not consider trapping the cause of the disappearance. He writes: "The theory of exhausting any wild tract of country by over-trapping will not apply to the territories of the Hudson's Bay Company. When Marten are abundant in good years, a favourably circumstanced hunter will use the same line of traps as successfully season after season; and results only decline as the Marten disappear, and increase again as they come back. In this connection, a very important factor is the periodic greater or lesser fertility of the female. The Indians have made the same remark in respect to Beaver, Musquash, Fox, Mink, and Lynx."

To this, Ross adds: "They are caught commonly in wooden traps baited with white-fish heads, pieces of fresh meat or, still better, with heads of wild fowl, which the natives gather for this purpose in autumn. When they are at their lowest ebb in point of numbers, they will scarcely bite at all. Providence appears thus to have implanted some instinct in them, by which total destruction of their race is prevented."[24]

The problem is far from solved. Doubtless, it is complex, but the facts as known may be thus summarized.

There are many irregular local migrations and variations of the Marten population, which, however, are not large enough to change materially the regular periodic rise and fall of its aggregate numbers. The Marten increases with the increase of the Rabbit, but begins to disappear while yet the Rabbit is abundant. I suspect that MacFarlane is near the truth when he makes it turn on the *greater or less fertility of the female*, which may be a result of the two causes, *starvation* and *overfeeding*. In famine years, the females do not breed, and in years of overfeeding they do not breed; so the *increase is ended*. There is no evidence of epidemic to account for the disappearance of those already existing. Probably it is the result of many causes. The increase has been stopped, and, owing to the growing scarcity of Rabbits and Mice, the Fisher, Foxes, and Lynxes—also greatly multiplied—prey now largely on the Marten. Cannibalism and starvation set in, and if any die by disease, they are never seen by man, because devoured by beasts. Meanwhile, hunger makes them ready to enter any baited trap, the trapper makes great catches; the surplus is soon worked off, and the Marten are reduced again to near zero.

Disappearing with the Forests

Like all the wild creatures of importance and value to man, the Marten is getting scarce. Each year its range is further restricted by the lumber-

[24] Pop. Treatise, p. 28.

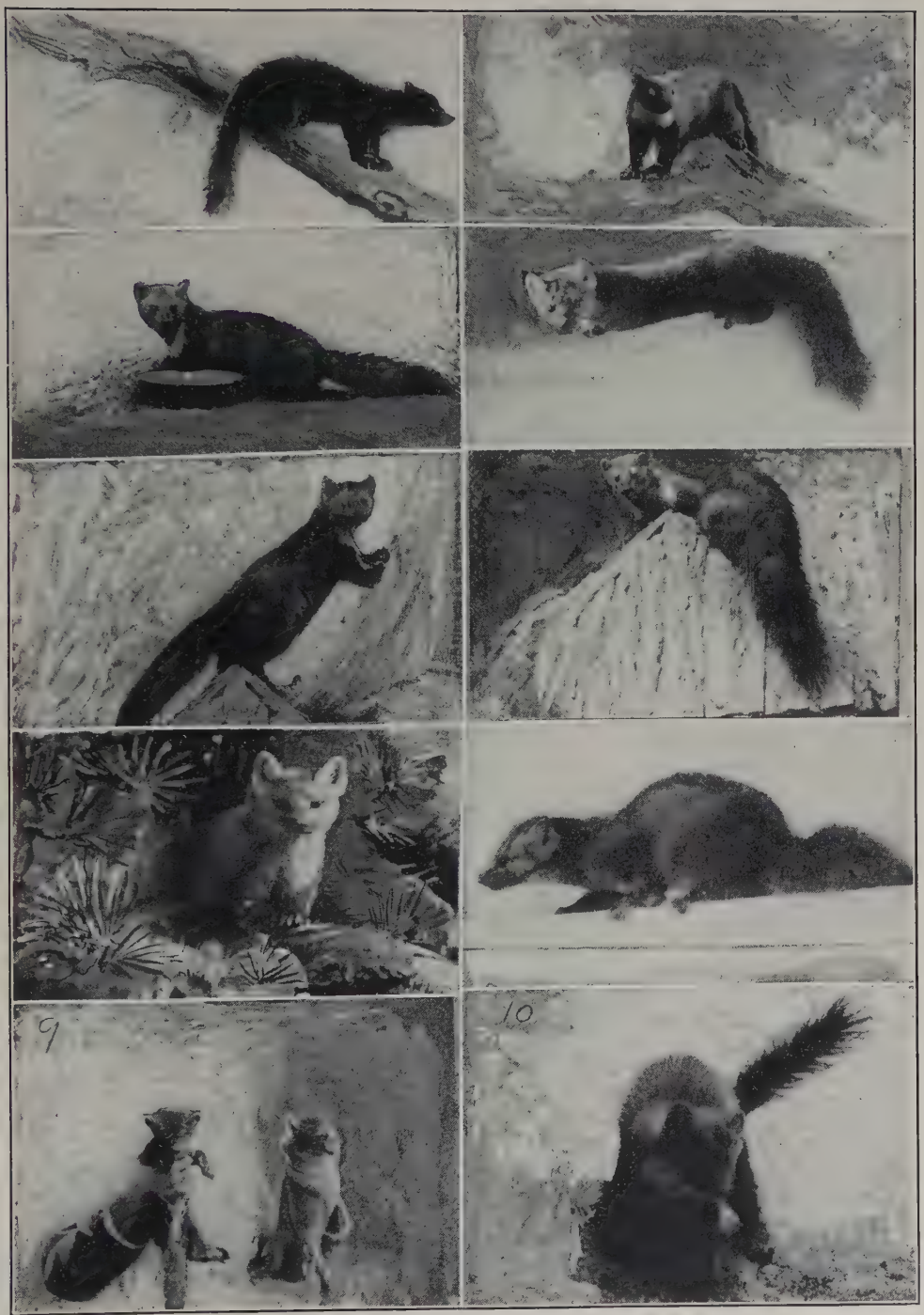

PLATE LXXV.—MARTEN PHOTOS

9. Lew Aumock's Tame Martens. 10. Marten Musking

PLATE LXXVI.—TAME MARTENS

men, the settlers, and the forest fires, for primitive evergreen forest it must have; and we of the woods know all too well how little of this is left.

In a belt along the south edge of its range, and comprising a quarter of the total area, the Marten is now a mere straggler; and from every part of this region, concerning which I have information, the same story comes: the species becomes ever scarcer. On this, the following records bear:

"In Newfoundland, annually becoming scarcer" (Reeks); in New Brunswick, "steadily decreasing in numbers" (Adams); Maine, "becoming scarce; rarely seen now in the southern part of the State" (E. T. S.); New Hampshire, "found occasionally in the northern part of State" (Jackson); Vermont, "formerly plentiful, now scarce" (Z. Thompson, 1840); New York, "quite numerous around Little Tupper Lake [Adirondacks] as late as 1891, but it has been trapped almost to extinction since that time;[25] Pennsylvania, "once abundant, now scarce" (Rhoads); New Jersey, "exterminated 50 years ago" (Rhoads); Michigan, "formerly general, now practically exterminated" (Wood, Dice, et al.); Illinois, "formerly found" (Kennicott); Wisconsin, "steadily decreasing in numbers . . . comparatively rare now" (Cory).

In the mountains it is holding its own or but slightly decreasing. Joseph Dixon says: "We are now facing the extermination of Fisher, Marten, and Wolverine in California. The number caught by the licensed trappers in the State during the years 1920 to 1924 inclusive are as follows: . . . Marten, 452, 227, 151, 137, 121."

To this he adds: "At the present rate of decrease, there will be no Martens or Fisher left in California within 5 years."[26]

Fur

The Winnipeg market quotations for March 26, 1904, were: For prime Marten, large dark, $6 to $12.

At the London annual fur sales, at C. M. Lampson & Co.'s (64 Queen Street, E. C.), March, 1906, the highest price reached was 290 shillings ($70) each for 24 very dark large Martens of exceptional beauty. Russian Sable, however, brought about three times as much.

Since the above times, the market value of skins has increased at least threefold. The average price of Canadian Marten for the season 1923–24, was $23.20 per skin. The record price during the fur boom of 1920, was $201 per skin for the best.

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[25] Madison Grant, 8th and 9th Reports, F. F. & G., Comm. N. Y., 1905.

[26] Cal. F. & G. Jan., 1925, pp. 23-25.

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 7,006,554 skins of this species, an average of 82,418 for each year. The lowest was 25,524 in 1829; the highest, 177,052 in 1854.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 2,611,500 skins were taken by the other American companies, an average of 36,781 each year. So that the average annual catch of Marten for fur, is about 119,000.

According to the government official reports, the number of Martens taken in Canada for the 5 years, 1919–20 to 1923–24 inclusive, is as follows: 57,077; 47,292; 58,989; 45,578; 46,407.

These figures show a diminution, but not as great as might have been expected. It would doubtless be more impressive if we had exact figures for the United States, where chiefly the shrinkage has taken place.

Food and Storage

What moss is to the Reindeer, what grass is to the Buffalo, the Mouse millions of the North are to all the Northern carnivores from Bear to Blarina. When we shall have fully worked out the life history of each of these species, I believe we shall learn that the whole of that vast, beautiful, important, and specialized production that we call the "carnivora," rests on a broad simple basis of *Muridae*, that in turn rests on the grass, that rests on the earth. We shall for each of these flesh-eaters write, "It sometimes eats this and sometimes eats that, but by far the greatest bulk of its food is Mice."

This is eminently true of the Marten. Its diet comprises partridge, Rabbits, Squirrels, Chipmunks, Shrews, and Mice; birds, birds' eggs, fledglings, frogs, toads, fish, insects, and Mice; but it also adds reptiles, nuts, berries, honey, carrion—and Mice.

A. P. Low, Director of the Canadian Geological Survey, tells me that the rowan berries (*Sorbus americanus*) are a winter staple of the species; and many of these animals die of starvation in the "off" years of the rowan.

"Sable sometimes will not take bait. Besides catching Mice, Squirrels, Rabbits, and birds, they often feed on the berries of the mountain ash and sometimes they will climb a tree to eat these berries, not noticing a well-set trap close by. They are an unsuspicious animal and are easily trapped when they will take bait."[27]

Speaking of the Fisher and Marten, the old fur-trader Martin Hunter says: "Their food consists of Rabbits, partridges, Mice, Squirrels, and fruit when in season. When the mountain ash berries are plentiful, and hang

[27] Manly Hardy, A Fall Hunt in Maine, III, Forest & Stream, May 21, 1910, p. 810.

late in the autumn, both the Fisher and the Marten are difficult, if not impossible, to trap, as there is no meat lure you can bait with, that will induce them to leave the berries."[28]

The Martens in my menagerie were extremely fond of dates and raisins; but their favourite food was a chicken head, raw, but smashed with a hatchet.

The Marten then, like everything else, is omnivorous, but I am satisfied that Mice constitute a larger proportion of its food than any other on its bill of flesh fare.

As Ross says, "Their principal food is Mice, and they are, therefore, abundant wherever these little creatures are plentiful."[29]

"The Marten loves to hunt Mice or the Whistling Marmot—Old Pike. His voracity knows no bounds, and when hunger gnaws, he will even attack a Skunk or any animal twice his size."[30]

Interesting light on another food habit is furnished by the following from Miller's "Mammals of Ontario."

"At Nepigon, a trapper told me that the Martens, wherever they occur in sufficient numbers, so terrorize the Red-squirrels by constant persecution, that the noisy rodents, learning that silence is their best protection, stop chattering. Hence, an abundance of silent Squirrels is—according to my informant, at least—a certain indication that Marten fur is plenty."[31]

Side light is furnished by the food habits of the British Marten, which is half-brother to our own. Millais says: "Failing other fare, the Marten slinks by the mounds of freshly turned earth, watching closely for the least movement of the soil; in the same way that Foxes and terriers lie in wait when hunting for this subterranean game. The earth gives a scarcely perceptible heave, as the Mole tunnels just below the surface; but the Marten is quick to perceive the motion, and, digging with rapidity, grips the soft velvety coat and drags out the impotent prey."[32]

It is interesting to note that the species never ventures near the habitation of man in the settlements, so that it is unknown as a depredator of the hen-yard. In the North, also, it usually shuns the vicinity of the trading posts. In this, it differs from all of its near kin in America as well as from its cousin, the Marten of Europe.

Each fresh investigation adds more creatures to the list of those that lay up for a rainy day. It is surprising to find that most of the Weasels

[28] Can. Wilds, p. 138.

[29] Pop. Treatise. p. 27.

[30] H. S. Peterson, Forest & Stream, April 30, 1910, p. 694.

[31] April, 1897, Proc. Bost. Soc. Nat. Hist., p. 42.

[32] Mamm. Gt. Br., 1905, II, pp. 81–82.

store food when they have a surplus. Linklater says that the Marten habitually does so. It eats as much as it can of the new catch, then buries the rest. This is true storage because, by setting a trap at the buried food, you are sure to get your Marten next day.

Sanitation and Diseases

All the Martens in my menagerie, or in captivity elsewhere observed by me, had one definite corner for the dung pile. They used this regularly and seldom defiled other parts of the cage. In this, however, there was great individual variation. All were scrupulously clean about their nesting boxes. Captain Craine's Martens were equally neat in their habits.

According to Hutchins, "This animal is sometimes troubled with epilepsy,"[33] a curious statement which appears in several old accounts of other animals. I assumed that it dated back to Aristotle, and paid little heed to it, until I received a rude lesson. I allowed a pair of my Martens to be exhibited at a Madison Square live-stock show. As soon as the curtains were removed from their cage, these highly strung creatures became panic stricken. They raced round and round the cage in a frenzy of fear, and finally, after a minute or so, fell on the floor in convulsions, writhing and champing their jaws like mad things dying. I supposed I had lost both of them. But within ten minutes, they recovered and cowered in the nesting box, apparently none the worse; leaving me, however, somewhat wiser.

Since then, I have seen this same demonstration at least 20 times, once while the Marten was in the examining box; and yet have never once seen the creature die in it, or in consequence.

A. H. Cocks informed me that the British Marten also, as well as Stoats, and Weasels in his collection, are subject to fits.

Water-bath and Sun-bath

The Marten is a Cat in its dislike of water. I never saw one of mine make any pretence at bathing. Lew Aumock says of his captive Martens in Idaho:

"These animals do not like the rain, and will stay in their dens for days when it is raining; except to run out and snatch their food, and run back to the den again."[34]

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[33] F. B. A., I, p. 51.

[34] Raising Marten, July, 1924, p. 56.

Richardson says: "The natives remark that the fur of the Martin loses all its lustre, and consequently much of its value, upon the falling of the first shower of rain for the season."[35]

No one has recorded the creature taking even a dust bath; but a sun-bath is much to his liking. Stretched on some high limb in the early morning when the sun comes blazing through, the Marten takes his tonic "ultra-violets." Oftentimes, this couch of treatment in his therapeutic scheme is the safe and handy platform furnished by a hawk- or crow-nest.

An interesting illustration of this was furnished me by my Adirondack guide, Bert A. Dobson, as follows: Nov. 14, 1900, he had posted himself in a ravine on a Deer path near Moosehead Pond, to wait for a chance, as the Deer were running on rut. In the tree below, he saw several bluejays shrieking and mobbing something which turned out to be a Marten that had gone up to sun itself in an old crow's nest. Every time the jays swooped the Marten would rise up and hiss like a Cat. Dobson shot it through the head from his stand.

Enemies

Man is, of course, the chief enemy of the Marten. In all these records of observations, I do not know of one case in which a man came in contact with a Marten without trying to kill it. Kill, kill, kill, for the lust of slaughter, even when no profit could be reaped in the way of fur or protection of live stock. As noted elsewhere, the annual slaughter for marketable fur is more than 100,000. This counts only the good prime fur taken in season. The wastage from poor, damaged skins, accidental destruction, animals killed out of season, young dying through the mother's death, would easily double this. Yes, man is the enemy.

In another form, too, he is exerting deadly powers. Forest fires are chiefly of man-made origin. A forest fire of 100 square miles means the destruction of all Martens within that 100 square miles. They cannot escape. The smoke pursues the fugitives, and overcomes them. Their food is destroyed in the stricken area. And of these fires, there is an average aggregate of 7,000,000 acres per annum; or, in 1923, of 21,000,000 acres.[36]

The next deadly attack is through the encroachment on the forests, made by the settler. The map indicates its ancient range, but there is a narrow belt along the south edge whence the Marten have been driven by the axe. Also it ignores the million lesser areas scattered through the great pine forests, each centred on a clearing, and each denoting an area of Marten

[35] F. B. A., I, p. 52.

[36] W. B. Greeley, U. S. Forest Service.

depopulation; for even the edge of an opening is repugnant to this wild wood spirit.

Among the enemies native to its woods, the Fisher is conspicuous because his method is one of open chase. As we note in the Fisher's Life, that paragon of agility can beat the Marten at his own game—can run him down in the trees, leap when he leaps, climb when he climbs, race when he races—outdo him at all points. The one safety of the lesser Tree-cat is a hole that is a tight fit for himself.

Nevertheless, the menace of the Fisher is too obvious to be really important. The Marten is probably the most difficult prey on his list. Outside of a few general remarks, more or less hearsay and current, there have been but two cases recorded by eyewitnesses, of Martens killed by Fishers. I doubt much if the Fisher toll of the species is one half of one per cent. of that levied by trappers.

The Lynx and the horned owl also are credited with being dangerous enemies to the Marten. Like the Fisher, they are able to take it by open onslaught. Therefore, doubtless, in the great struggle, they count for little as destroyers. The really dangerous foes are likely to be much less dramatic and obvious. We shall probably find that the Marten's numbers are kept down by something as intangible as it is unexpected and irresistible —possibly a parasite, a disease, starvation, some evil habit of the race. Or it may be as MacFarlane suggests, an inexplicable periodic infertility of the females—an infertility that I should not be surprised to find a consequence of overabundant food, which is often as bad as starvation in its effect on the reproductive organs.

Mating

The mating of Martens is shrouded in mystery. There is no positive evidence that they are monogamous, polygamous, polyandrous, or promiscuous. Apparently no one has ever yet seen two adult Martens living together freely and amicably. No one has seen them combining their efforts in any direction—work or play.

Lew Aumock, after unusual experience as a fur-farmer, as well as a trapper, writes in substance as follows: During the rut, the males will fight to a finish; and if there is one male with several females, the strongest female will drive the rest away. There is only one way to raise them successfully, and that is to keep each in a separate pen, except at rutting time. Then turn one male in with one female; watch them closely at first to see that they do not quarrel. If they start to play, leave them together for a time; if they quarrel, separate them at once, or the female may be dead in

the morning. I know one fur-farmer who lost about 20 pairs of Marten in 3 years because he did not know this.[37]

Analogy seems to prove that the species pairs; but the slight evidence at hand would add that they part again in a few days; and the less they see of the cutthroat sire, the better for mother and young. This is all so unnatural, and so largely founded on cage-observation, that we must hope for a pleasanter picture when better study of wild individuals supplies more reliable facts.

A curious item bearing on the relation of the sexes is supplied me by Madison Grant. In the winter of 1901–02, two Bitterroot guides set about catching Marten on the headwaters of the Clearwater, with a view to starting a fur farm. They said that they captured two dozen during the winter, but all were males. So, in the spring, they killed what they had and marketed the fur. They believed that the females were lying up and the males were feeding them.

Miles Spencer says that, according to the Indians near Fort George, H. B., the Marten there mate about the first of March.[38] I learn from the guides in Algoma, 600 miles farther south, that Marten pair from the 15th to the 20th of February. Captain R. Craine, of Wayagamug, Mich., tells me that in the winter of 1894, he captured a female Marten on the upper Fraser in British Columbia, and kept her three months before she escaped. On this individual he made many interesting observations. She came in heat early in March. At this time the anal parts were inflamed and swollen; she had a curious way of rubbing them on the floor. Sometimes she would back slowly up the wall of the cage, tail first, until she touched the top; and from time to time during the night, she would utter a prolonged screeching, keeping it up until someone shouted at her.

This is all the direct testimony I can find on their mating habits. But the collateral evidence of the British Marten bred in captivity by A. H. Cocks, of Henley-on-Thames, England, is next best thing. "Litters of this species," he says, "have been bred in my collection. . . . All attempts at breeding were extremely hazardous; the allowing of a pair to run together was apt to result in the death of the female, in consequence of one or more of the long canines of the male penetrating her brain, the damage being inflicted so instantaneously that there was no possibility of a timely separation."[39] The union, he believes, takes place at night. I give a condensation of his account. "At last (first week in January), this year we

[37]Hunter-Trader-Trapper, May, 1925, p. 75.

[38]Low, Expl. James Bay, Can. Geol. Surv., 1888, Pt. J, App. III, p. 77 J.

[39]Proc. Zool. Soc., Dec. 4, 1900.

noticed little mouthfuls of short straw deposited here and there in the cage. . . . Accordingly, a male was admitted from the adjoining cage on Jan. 5 . . . and the pair finally separated on the 18th. . . . Young were born early on Apr. 22. . . . The probable period of gestation of this species is, therefore, a few hours over 103 days; the extreme of possibility ranging from 96 to 106 days."

A. H. Cocks very appositely remarks here that this duration is a surprise, as the Polecat goes 40, the Otter 61, and the Ferret about 42 days.

Den

The favourite place for the den is a hollow tree, at a considerable height from the ground. The sort of place selected is much like what would appeal to a Red-squirrel, but a little larger. It is likely that the flicker and pileated woodpecker are house providers for a large proportion of the little Martens.

Bernard Ross alone ascribes to the species a den underground, and this only occasionally. He says: "Their dens are sometimes excavated, but more frequently are made in a tree."[40]

My own caged Martens were very ready to hide under a log, or in a low-placed box. According to Lew Aumock, if his caged Martens do not like the dens he supplies, "they will dig the ground up, to try to make a suitable place to have their young."[41]

All observers agree that the nest is made by the female alone, and is carefully lined with grass and moss.

Young and Age

The young number from 1 to 5. Lew Aumock writes: "I have known of a litter of 7."[42] They are usually 3 or 4, and are born in late April. Spencer says, on the evidence of his Indians, that at first "they are the size of a new-born kitten, brown and black in colour [not white], helpless, with closed eyes. The female suckles the young for a period of 5 weeks, and is unassisted by the male in rearing them."[43]

George Linklater, of Des Barats, tells me that he once saw a female out in May, with 4 young ones that she was teaching to hunt. This was in Algoma.

Since the young need the mother's care all summer, we must believe that but one brood is produced each year. Here the positive evidence gives

[40] Pop. Treatise, p. 27.

[41] Hunter-Trader-Trapper, May, 1925, p. 75.

[42] Raising Marten, July, 1924, p. 54.

[43] Low, Expl. James Bay, Can. Geol. Surv., 1888, Pt. J, App. III, p. 77J.

PLATE LXXVII.—ATTITUDES OF MARTENS
Drawn from life. Chiefly in Philadelphia Zoo, 1899

out, but help for future observations may be found in Cocks's notes on the development of an English Marten brood that he reared in captivity. His main facts are as follows:

They were born April 7, 1882. They numbered 3 (2 males, 1 female), and at first, all were *quite white*. On the 10th, one examined was 6 inches long; of this, the tail was $1\frac{3}{4}$ inches. On the 14th, the white fur was grizzled. On May 6th, they were yet blind; but some time prior to the 20th, that is, at a little over 4 weeks, their eyes opened. On the 29th, the mother first fed them fresh meat. On June 23rd, at 7 weeks of age, they first left the nesting box, and came to the ground. In autumn, they were full grown.[44]

One pair which bred in captivity lived till their 17th year.

Sociability and Voice

This interesting creature appears to be the least sociable of this unsociable family. Otters will meet to enjoy their slide in a merry party; Skunks will gather for warmth; the smaller Weasels will help each other in distress or in hunting. But, so far as I can learn, no man ever yet saw two adult Martens meeting with feelings other than those of deadly hate; the one essential supreme exception to this is, doubtless. found in the moment of sexual congress.

Not having many ideas that it wishes to communicate to its kind, the Marten has few methods of communicating them. The scent-glands, so important to its kindred, are greatly reduced in this species. Nevertheless, the British Martens that I saw in A. H. Cocks's menagerie, made use of the musk gland at least every five minutes, as they galloped about, pressing the parts on some projection of the cage. The sketches illustrate two in the act; both were males. It is easy to see how this may be a means of letting others of the kind know that a Marten has been here recently.

My caged Martens gave vent to a growl, a hiss, and a snarl which sometimes became a shrill screech. Cocks's Martens bleated like a lamb when hungry.

"The Marten," says Richardson, "when its retreat is cut off, shows its teeth, sets up its hair, arches its back, and makes a hissing noise like a Cat."[45]

Lew Aumock says of his Idaho Marten: "Sometimes they make a little cooing noise, then a terrible scream, then perhaps a cackle something like

[44] Proc. Zool. Soc., Dec. 4, 1900.

[45] F. B. A., I, p. 51.

that of the hen. They will growl like a Dog, and will jump at their enemy, and let out a terrible scream."[46]

"When enraged, they utter a sound somewhat like the hissing of the domestic Cat."[47]

How They Kill Him

There are three methods in use for taking this Tree-cat. The first, is by still-hunting and shooting. The Marten is so shy and watchful that the opportunities for this are rare and becoming more so, as the Martens redouble their shyness under the stress of continual persecution.

The second method is by hounding and shooting. It is thus described by Raymond Thompson. Discussing the Marten and Lynx in the Athabaska region, he says:

"The Indians have a very novel way of taking these two fur-bearers. Both of these animals will 'tree' quite readily when pursued closely by Dogs. Every family of Indians, as a rule, will have one or two trained tracking Dogs. After a fresh snow, the Crees will go out with their Dogs and put them on the first recently made track of Marten or Lynx that they come across.

. . . . . .

"The Marten, being considerably smaller, is a more difficult animal to keep track of than the Lynx. I have chased a number of Martens, both with Dogs and alone; and my success was nothing to brag about. The trouble in 'running the Marten down' is that, once he gets into a sizable group of pine or spruce trees, he will leap from one to another, and in this way throw the Dogs off the scent. All they can do is to trace the animal while he is on the ground. Three or four Indians will sometimes get after the same Marten, and in this manner they have greater chance of locating the little fur-bearer. By striking hard on the trunk of a tree, one can tell whether a Marten is in it; for if he is there, he will immediately jump for another."[48]

The vast majority of Martens taken are secured by trapping. As this fur-bearer is unsuspicious and greedy, it is easily trapped. In early days, the deadfall trap was used with a figure-4 trigger.

"It is considered a very good day's work in December for a trapper to construct, bait, and set up 25 such traps. A real Marten hunter . . . camps each night at the end of his day's work, until he has from 150 to 200

[46] Raising Marten, July, 1924, p. 56.

[47] B. R. Ross, Pop. Treatise, pp. 27–28.

[48] Forest & Stream, May, 1923, pp. 237, 270.

traps set! He generally visits them once in 10 days or a fortnight; and if the catch averages one Marten to 10 traps, it is considered very fair."[49] Half a dozen to the mile on a 20-mile round was a usual line of traps; though it varied greatly according to the country.

In the deadfall, the animal was instantly and mercifully killed. Within an hour, it was frozen stiff, and kept perfectly for weeks if need be, till the trapper came the rounds.

The other kind, that most in use to-day, is the steel trap. Hunter says: "When small steel traps are used instead of the deadfall, the hunter can cover more ground in a day, and do better work than by making all-wood traps. The steel traps are much more fortunate than the wood ones. In the 'figure-of-4' traps, before the animal is caught, it must seize the bait with its teeth, and pull strong enough to set off the trap, whereas with the steel trap, the mere fact of his coming to the doorway to smell insures his putting his foot in it, and in a moment up hangs Mr. Marten or Mr. Mink, as the case may be!"[50]

Notwithstanding the argument of some that the Marten does not suffer very much, that his toes when caught are quickly frozen to insensibility, and that, within a few hours, he himself is dead from exposure, the steel trap is brutally cruel, and is destructive beyond what the Marten supply can possibly stand. A strong effort is being made to put this method under the ban law—an effort that is likely to succeed in the near future.

Because of its intense local colour, and the vivid realization it supplies of the trapper's life and work, I quote from H. S. Peterson's article on trapping in the Sierra.[51]

"Following the 'long blaze' in the pursuit of the Pine Marten," he says, "is the trapper's most lucrative quest. His preliminary campaign entails not a few hardships. The Marten trapper commences his timber cruise early in the fall, say the middle of September. If he is alone and thoroughly understands his business, he goes light, unencumbered with camping paraphernalia. A blaze axe and rifle, together with a pack bag in which is stored snugly enough food to last 10 days or 2 weeks, meet all his requirements. . . .

"The lay of the land is first thoroughly considered, and in his mind's eye he already sees the swish of the bough or the rift in the tree bole from which Pussy Marten will emerge in the gloaming of the evening. Close by a shelving rock near some trickling rill, or under the roots of a windshake, the trapper establishes his first rough-and-ready camp. . . .

[49] Hunter, Can. Wilds, p. 101.

[50] As above, p. 101.

[51] Forest & Stream, April 30, 1910, p. 694.

"If any there be who thinks that the line of a Marten trapper is blazed out along flowery beds of ease, let him come with me through the jack pines or along the log walks over down timber; and if he escapes a broken leg or barked shins, he has only then commenced to know a trick or two. When the snowfall is from three to six feet deep, and the mountainside is not too steep, the snow in midwinter will pack over the tangles of down timber, making it easier to 'mush' over with skis. But at its best, it is a crafty undertaking; and one had better take the dividing ridge, or skirt the down timber. Woe to the unlucky trapper who should break through a pot hole or side rift. He may break a shoe, and then, if he flounders out on good crust, he has reason to thank his lucky star. If, in quest of his game, he takes to the high ridges, he has the snow-combs to contend with. To fall into a rip of a snow-comb will surely start a snowslide, and if it is a wet slide, the trapper will be swallowed up in the avalanche of snow and buried alive.

"Trapping for Pine Marten along the low-lying ridges, or through stretches of timber on elevated plateaus, is an easy task in comparison with the work required of the regular 'high-liner' who beards the storm king to his face. He is the one who takes the sleek Pussy that brings $30 per pelt in the Eastern markets."

Trapper Ethics

An extract from Manly Hardy's journal during his fur hunt in Maine, Oct., 1859, offers vivid light on trappers' troubles and Indian good faith. He writes that Rufus, his partner, "met the Indians on the near end of the carry, coming for their last load. John Brassua [the Indian chief] told him that he passed a Fisher and a Sable in our traps; should have hung them up and reset the traps, but feared we might not like for him to meddle. A good many times, I have had white men take game out of traps, often stealing trap and all; but I never had an Indian take either; though once, when Mink were worth $7 or $8 a piece, an Indian took pains to cover up a Mink, which was in my trap, for fear that the sun would injure it. Old Brassua had a good deal to say about the waste of time in building our camp. 'Tell my son take them buggers two days and a half make that house. When we camp, we camp; when house, we house.'"[52]

Catching Marten Alive

So many men are at work solving the problem of fur-ranching Martens, that there is a large and strong demand for living Martens as breeding stock. This has developed the new business of Marten catching.

[52] A Fall Hunt in Maine, IV, Forest & Stream, May 28, 1910, p. 848.

Since it is important to secure the animals uninjured, most have assumed that box traps, that is, "catch-alives," alone might be used. But these call for so much initiative on the part of the Marten, that other means have been adopted.

Among the men who follow this calling, Lew Aumock is singular in combining the power to do with the gift to tell of it. A portion of his article on Marten catching is not only good trapping and good natural history, but also a vivid picture of the trapper's life and hardships.

He begins by discussing different types of trap that may be used in winter. Box traps, he says, are of little use. They are too heavy to carry, and are put out of order by snow and frost; unless, as rarely happens, you can find a hollow log in which to set them. Steel traps alone, he maintains, are satisfactory, and continues:

"The best kind of steel trap to use, is the little double-jaw jump trap, No. 91, or any trap of that size and with *double jaws*, mind you; and use two at each set. Find hollow trees to set them in, so when a Marten gets caught, he will be protected from the severe weather and not hang himself and freeze to death. By using the double-jaw traps, you are practically sure of having a live Marten when you come to look at your traps, provided you look at them every two or three days, and if you have them set in good sheltered places, as I have said.

"The small double-jaw traps catch across the palm of the foot, and if you have two traps set, and if he gets a trap on two of his feet, he can't twist very much. I have had them in these traps for two and three days, and they were still alive and in good shape, if the weather was not too severely cold. Of course, if the weather is extra cold, most any animal will soon freeze to death. Sometimes I have come to them when they were just about dead, and have taken them out of the trap and held them under my coat for a while, and they would begin to liven up; then I would put them in the tin box that I always carry in my sack, and put a Pine-squirrel in for them to eat, and be on my way. [The tin boxes are 4 inches by 6 inches by 12 inches long, solid tin at one end and with heavy woven wire door at the other. They are varied in size so one or two can nest in each other. The tongs are pinchers that fit tight on the Marten neck without choking it].

. . . . . .

"When I come to a live Marten, I take my tongs that I carry for that purpose, and I snap them on to Mr. Marten's neck. Then I take the trap from his foot with one hand while I hold the tongs with the other (and believe me, I sure hold on to those tongs, too), and then I chuck him into the

Right feet of Rocky Mountain Marten ♀ (*M. c. origenes*) (life size)
Drawn by E. T. S., at Marvine, Colo., Sept. 19, 1901

Marten tracks
Drawn in Bitterroot Mountains, Idaho, Sept. 26, 1902

PLATE LXXVIII.—MARTEN DETAILS AND TRACKS

tin can tail first. I close the lid as much as possible before I loosen the tongs, so he can't jump out. If he has the least bit of a chance, he will jump out before you could wink your eye, and if he does get out, all you can do, is to sit there on the snow and watch him go, and he will sure show you some speed, too.

"When I get a Marten in a can, I carry him in my hand, for he will sometimes get seasick if you put him in the sack where he can't see out. If it is real cold, you must put the can in your sack, or the Marten will soon freeze to death; and stop and take a look at him every once in a while to make sure he is all right. If he acts like he is groggy, then hold the can under your warm mackinaw coat for a while, he will soon be all right. I always put some fine dry grass or pine needles in the cans for them to sit on. . . .

"For summer trapping of live animals, you had better use box traps." And how he makes and uses them is of thrilling interest to the few who are in the business. They are referred for fullest details to Aumock's article in *Hunter-Trader-Trapper*, June, 1924, pp. 54–58.

His Way of Life

Of all the Weasel tribe, the Marten most is at home in the trees. He delights in climbing from crotch to crotch, leaping from tree to tree, or scampering up and down the long branches with endless power and vivacity. One cannot long watch this creature, even in a cage, without getting an impression of absolutely tireless energy. For hours he will race up and down, leaping from perch to wall, to ground, to perch, to wall, to ground, to perch, over and over again, doing endless gymnastic feats, giving countless surprising proofs of strength, with bewildering quickness, all day long, without a sign of weariness, without a quickening of his breath. He must travel many hard miles each day in his way; yet it is complained that in confinement Martens suffer for lack of exercise.

"Active as a Squirrel" is an old adage, and yet the Squirrel is commonly the prey of the Marten.

It is remarkable that the Marten should follow the Red-squirrel in all its range, but hardly anywhere encroach on the territory of the large Gray- and Fox-squirrels—species which seem to afford special inducements to the active destroyer. For their numbers are great, he can follow into their holes; and their weight is so nearly that of his own that he is under no handicap in the leaps from tree to tree.

Daniel Hayward, of Oxford County, Maine, says: "It is impossible for Gray-squirrels to exist in the same locality with the Sable, as their sizes

are about the same, and the Squirrels easily become their prey. They will also outstrip the Red-squirrel, and capture him if he confines his retreat to the trees instead of entering holes too small for the Sable to follow. He will pounce upon and overpower a partridge or Rabbit, but usually takes the latter by the long chase, which seemingly lasts often for many miles; which speaks well for his endurance and persistent running abilities."[53]

There can be little doubt that the Marten is a determining factor in the range of the Gray-squirrel.

Both Diurnal and Nocturnal

Several authorities maintain that the species is nocturnal, and many that it is diurnal. My own experiences incline me to the latter view, or both. Obviously, it could not hunt Squirrels by night. But it does hunt by night to some extent. No doubt at this time, it preys on Mice, but it is so wonderfully clever at hiding that it is rarely seen.

D. Hayward, of Maine, says: "The Marten is an animal not very often seen at large. I have caught as many as 11 in one day, but in all my experience in the woods have only seen 3 alive and at liberty. This has been thought to be accounted for by their being nocturnal in their habits, but such is not strictly the case. I have often seen their tracks made in the daytime."[54]

Roderick MacFarlane tells me that he has several times found Martens taken in his traps on the same day as they were set, in fact, but an hour or two afterwards; although the animal was rarely seen. But he also adds: "I have known Martens come inside our fort at night to get at white-fish hung on stages, and some have actually been trapped in such places."

I conclude that the creature hunts chiefly by day when the sun is low, but occasionally by night.

Curiosity

A Marten in a cage is a picture of life and energy, alert to everything. Its keen eyes are quick to take in each new sight, and its ears acock for any new sound. It twists its head to one side, and peers and sniffs with evident curiosity at every strange object. All the hunters agree that this hankering to know, this itch to see, smell, and find out, is a master failing of the Marten.

Merriam writes: "Mr. [John] Constable tells me that when a hunter discovers a Marten climbing about among the tree-tops, he has only to

[53] Shooting and Fishing, April 16, 1896, p. 537.

[54] As above.

Marten
Drawn by E. T. Seton for the Biological Survey, U. S. Dept. Agr.
N. A. Fauna, 16, 1899, p. 106

British Martens rubbing their musk on projections in the cage

PLATE LXXIX.—MARTENS (FROM LIFE)

whistle, and the inquisitive animal will stop and peer down at him, affording an excellent shot."[55]

Similar observations are found in Kennicott's account. "The retreat of the Martens," he says, "is usually in standing hollow trees, and . . . in winter, they may frequently be discovered sitting with their heads out of the holes. As, if shot in this position, they would fall back and be lost, advantage is taken of their inquisitiveness by walking slowly around the tree and inducing the animal to draw its body entirely out of the hole, in order to keep the object of its curiosity in view. When quite out, a well-directed shot brings it to the ground."[56]

Curiosity is a beginning of knowledge, and is proof of intelligence. These observations, therefore, give to the Marten a higher place among its kin than would its behaviour in family matters.

Tame Martens

As far back as the records go, the Marten is described as easily tamable. Richardson says: "It may be easily tamed, and it soon acquires an attachment for its master, but it never becomes docile."[57] The last remark is understood to refer to those caught after fully grown.

Similarly Bernard Ross, in 1861, wrote: "Martens are easily tamed and look exceedingly pretty as pets."[58]

Lew Aumock adds: "I will admit that wild Marten are a hard thing to tame; but I have tamed them enough so I could put my hand on them, though if I tried to pick them up they would run away.

"They are a savage little brute, and had rather bite than anything else, though, when born in captivity, they will become quite tame if properly handled, and will climb all over the keeper for a bit of something good to eat. For instance, put some raisins between your fingers and hold your hand still, and see them try to get them without biting you."[59]

There is much evidence on record to show that Martens taken young are easily tamed and soon acquire an attachment for the one who feeds them, but never become quite docile. Captain Craine's Marten was fond of being petted by her owner, but continued savage to all strangers. On the other hand, many observers testify that, in the Northwest, one often sees

[55] Mamm. Adir., 1884, p. 53.

[56] Quads. Ill., 1859, p. 243.

[57] F. B. A., I, p. 51.

[58] Pop. Treatise, p. 28.

[59] Raising Marten, July, 1924, p. 55.

tame Martens following the Indian children, who catch them young and bring them up as pets; these are as tame and playful as kittens.

The Indians usually keep the young ones they chance to secure, and have no trouble in taming them.

During my Athabaska Journey, in 1907, my half-breed guide, E. Robillard, told me the following: One year, in the early spring, near Lac la Biche, his brother-in-law, Ben Edwards, saw a Marten come out of a hole under a stump. He dug in, and got two little Martens. These he brought up. He had them a year and a half before they were killed by the Dogs. They had a box of sand and ashes; in this, they always buried their dung. They would sleep in bed with the children, under the blankets; and never got cross. They were male and female. They were cleaner than Cats. They were never seen to cache food. They ate only meat and fish, or perhaps bread with grease on it. They caught Mice; hunted day and night, but chiefly by night. They were free of the country, often went to the woods, but always came back. They curled up together to sleep, never quarrelled, uttered sometimes a shrill screech, and were so tame that they often crawled into one's pocket to sleep.[60]

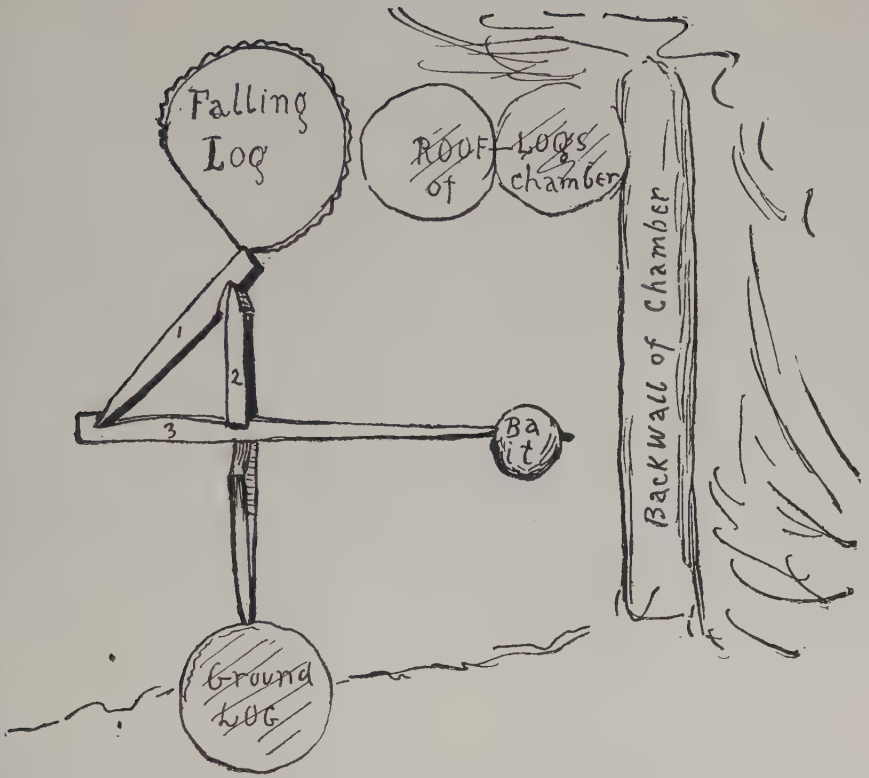
In 1913, while in Spain, I bought a tame Marten. It was full grown, but as tame as a kitten. I handled it freely, but alas! I had to send it by "Grande Vitesse" to England, as the first stage of its journey to America. "Grande Vitesse" was so slow that the Marten gnawed its way out, and the guard had to "shoot it to save its life." This was apparently *Martes foina mediterranea.*

The most detailed case at hand is from the pen of G. A. Paddock. It appeared in *Recreation* for Aug., 1899, pp. 81–82. It was for this I made the illustration reproduced here.

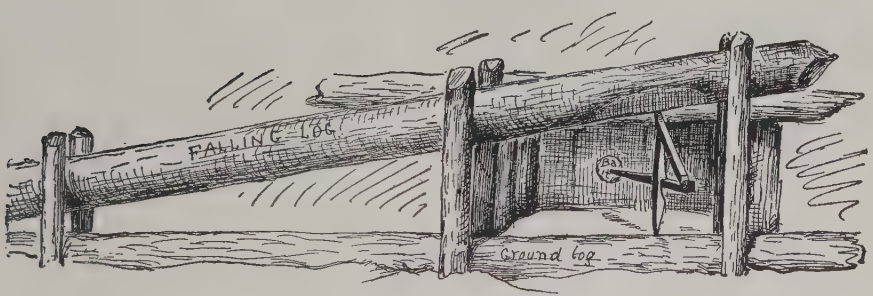
"Last spring," he says, "I had the good fortune to capture two young Martens out of a litter of four. The nest was in a hollow log. I brought my prizes home, the little fellows sitting on my shoulder all the way, without trying to escape. After giving them a hearty meal of bread and milk, sweetened with sugar, I put them in a box covered with slats. They at once fell asleep, and did not awake until everyone was in bed. Then they gnawed out of the box, and had a merry time playing about the house the rest of the night. In the morning, they were found, fast asleep, in a coat pocket about 5 feet from the floor.

"They soon became great pets. When playing, they make a sort of deep clucking noise; and when angry, make a curious sound between a growl and a bark. If they do not want to be picked up, they will scratch and bite

[60] Arctic Prairies, 1911, p. 357.



Section of deadfall, showing trigger set



Front view of deadfall set for Marten

PLATE LXXX.—THE MERCIFUL TRAP—THE OLD-FASHIONED DEADFALL

fiercely. I once received five deep bites in my hand while trying to capture one when he was cornered.

"At first, we let them loose in the house; but after they had broken two goblets and various other things, mauled a Cat to death, bathed in the water pail, rolled in the flour barrel, eaten sugar out of the bowl, tracked butter over the tablecloth, and played other pranks too numerous to mention, we decided to keep them outdoors in a cage. Accordingly, a wire cage about 8 by 2 by $2\frac{1}{2}$ feet was made. The Martens were put in their new home and are there now. They are nearly full grown. One is light brown in colour, with a face nearly white; the other is nearly black with a light-coloured face. They both have bushy black tails, and their lower legs and feet are black.

"One day my Martens escaped from the cage and ran to a chicken coop in which there is a barrel with a hen's nest at the bottom. As I entered the door, one of the Martens jumped from the bottom of the barrel, landed on the edge, then sprang to the floor, and started off with an unbroken egg in his mouth. I made after him, and he dropped the egg. Being quite tame, they were easily captured again.

"At another time when they escaped, they killed a duck, dragged it about 75 feet, then left it without eating a mouthful."

It will be noted that all of these successfully tamed Martens were captured very young. I have never heard of one captured adult being even partly tamed.

His Clever Elusiveness

In Great Britain, they have a Pine Marten which is closely akin to ours and identical in life and habits, so far as I can learn; and gifted with the same rare talents in senses, bodily activity, and elusiveness. J. G. Millais writes:

"Even where it is fairly numerous, it is no uncommon thing to meet men who have spent their lives in close vicinity to this shy animal, and who have never seen it or even suspected its presence."[61]

And again: "Long hours, and often whole days, of watching must be spent by one who wishes to see the creature, whether at work or play. It is, indeed, easier to trap a Marten than to observe one at liberty. Foxes, and especially Fox cubs, may be seen on a moonlight night by any enthusiastic field naturalist who possesses the patience to remain perched for an hour or so in a tree near an 'earth.' The Otter will sometimes show itself to a salmon fisher in a summer twilight, or before the sun is up; but an oppor-

[61] Mamm. Gt. Br., II, p. 80.

tunity seldom occurs for watching the Marten on the track of a Hare, or sneaking up to a sitting grouse. It is not surprising that the oldest native of a locality wherein Martens are still to be found shakes his head at the assertions of a naturalist who has been at pains to make the discovery."[62]

Every word in the above strong statements, every touch in the picture, is exactly and fully applicable to the Pine Marten of America. Although I have spent, all told, many years in Marten country—in Ontario, Quebec, Manitoba, the Mackenzie, the Rockies, and the Sierra—I never but once saw a live free Marten. There can be little doubt that, during that time, a great many saw me, for the tracks were plentiful.

As noted in the section on its diurnal habit, D. Hayward, an old trapper, who caught as many as 11 in one day, saw but 3 alive and at liberty in his whole experience. Similar testimony is offered by R. MacFarlane, and, indeed, by all trappers whose notes are at hand.

Otherwise expressed, there are on the Marten range at least 500,000 wild Martens running about like Squirrels, making a hunter's living 365 days in the year. There are, at least 500,000 human beings with keen eyes on the watch in that same region. Yet the number who have ever seen a wild live Marten is very few; and the number of times these have been favoured is about 1 out of a possible million.

References for Marten

1829—Fauna Boreali Americana, by Dr. John Richardson, I.
1861—A Popular Treatise on the Fur-bearing Animals of the Mackenzie's River District, by B. R. Ross, *Can. Nat. & Geol.*, VI, pp. 5–36.
1907—Canadian Wilds, by Martin Hunter.
1924—Raising Marten & Fisher, by Lew Aumock, *Hunter-Trader-Trapper*, June and July.

[62] Mamm. Gt. Br., II, p. 82.

LIFE XXXIV—THE MINK

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Having saved her young ones from the Dog, the old Mink dived after them

The Mink, Minx, Vison, Water Weasel, or Least Otter

Mustela vison Schreber

(L. *Mustela*, a Weasel; *vison*, meaning?)

Mustela vison Schreber, 1777, Säugthiere, pl. 127 b.

Type Locality—Eastern Canada, i. e., Quebec.

French Canadian, *le Foutereau.*
Cree, *Sang-gwiss'*. According to Richardson, *Shakwaeshew* or *Atjackashew.* Hearne gives it in the corrupted form, *Jackash.*[1]

Ojibway, *Shang-gwes'-se.*
Sauteaux, *Sang'-way-soo.*
Chipewyan, *Tel-chu'-say.*
Ogallala Sioux, *Lo-chin'-cha.*
Yankton Sioux, *Doke-sesch.*

The word "Mink" is usually traced to the Swedish "Maenk," though it is not clear how or when the word crossed the ocean.

The name "Vison" was first recorded by Kalm in 1749. He says: "The Visons or Foutereaux are a kind of Martins that live in the water."[2] This was seized on and formally adopted by Buffon in 1765. Coues says, concerning this name: "I have only to remark on the authority of Von Martens, its apparent relation with 'Weasel' through 'Veso.'[3] W. W. Skeat, discussing the origin of 'Weasel,' says: 'As the characteristic of the animal is its slenderness, I would propose to translate it by "the little thin creature," and to connect it with "wizen."'"[4]

The genus *Mustela* (Linnæus, 1758) comprises weasel-like animals with long, slender bodies, short legs, with five toes on each foot, more or less bushy tails, short ears, and teeth as follows:

$$\text{Inc.}\ \frac{3-3}{3-3};\ \text{can.}\ \frac{1-1}{1-1};\ \text{prem.}\ \frac{3-3}{3-3};\ \text{mol.}\ \frac{1-1}{2-2} = 34$$

[1] Journey, p. 376.
[2] Travels, II, pp. 397–98.
[3] Fur-bearing, p. 172.
[4] Dictionary.

The Mink unites these characteristics with the following:

Size. Length, about 24 in. (610 mm.); tail, 7 in. (178 mm.); hind foot, $2\frac{1}{2}$ in. (63 mm.). The females are smaller.

Weight. An ordinary ♂ weighs about 2 lbs., but I have seen adults that were only $1\frac{1}{2}$ to $1\frac{3}{4}$ lbs. The largest I ever weighed was taken at Winnipeg, Nov. 1, 1907; it turned the scale at 2 lbs. 6 oz.

Allan Brooks writes: "The males of the Pacific Mink [*energumenos*] are especially large, a good-sized adult weighing 4 lbs."[5]

Zadok Thompson, also, doubtless with good reasons, says of the Mink: "When fully grown, their weight is about 4 lbs."[6]

The ♀'s are considerably less than the ♂'s, weighing, according to Resseque, about 1 lb. 10 oz.[7]

Colour. In general, the Mink is nearly uniform umber-brown, darker and glossier on the back, and deepening on the tail nearly to black; the chin is more or less white, and there may be some white spots anywhere on throat, breast, or belly, but these are very irregular; some specimens are totally without white. In the American species, the white does not reach the upper lip. In the Siberian species, the upper lip is normally white. This animal does *not* turn white in winter.

The impression it gives as it dodges in the woods along the water, is of a long, thin Rat, with brown fur and hairy tail.

The development of the Mink's coat is thus described by Manly Hardy: "In August a Mink has a coat of long hair, quite a bushy tail, and a sickly yellowish-white pelt. At this stage they are known by the trade as 'August prime,' and they so closely resemble the real prime that when Mink brought from $6 to $8, inexperienced buyers often paid $4 to $5 for skins for which they could not get over 25 cents. In September, this long hair sheds out, the tail is not much more than skin and bone, and the pelt is coal-black. The new coat begins to grow, and by the first part of November or earlier the pelt is clear white and the fur fully grown."[8]

Silver Mink. An interesting and valuable freak, the Silver Mink, is thus recorded by Bachman: "A short time since, we were kindly presented by Charles P. Chouteau, Esq., with a Mink skin of a beautiful silver-gray colour, the fur of which is quite different from the ordinary coat of the

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[5] Recreation, May, 1900, p. 355.

[6] Nat. Hist. Vermont, 1854, p. 32.

[7] Fur-bearing, p. 183.

[8] Forest & Stream, May 28, 1910, p. 850.

animal. These beautiful skins are exceedingly rare, and six of them, when they are united, will make a muff worth at least a hundred dollars."[9]

If 6 of them, when matched, were worth $100, with $1 as a standard price for Mink, the same combination to-day would be worth at least $1,000.

Cotton Mink. Among the curious and worthless freaks that have no reference to season, place, or age, is the Cotton Mink, distinguished from the normal Mink by having the under fur of flimsy texture, and drab or white instead of dark brown or warm gray. This sport or disease is well known in the fur business. Henry Bertman, of Rockbridge, Ill., considers the abnormality the result of an obscure disease, and thus discusses it:

"These Mink, of course, derive their name 'Cotton' from their fur, especially the under fur, which, according to the stage of their sickness, may be gray, light, and finally white; not unlike cotton in colour and texture. The outer fur never, in my experience, shows any perceptible evidence of the condition of the under fur, but on brushing aside the outer fur, one readily sees the white under-coloured fur which characterizes Cotton Mink. This procedure of examining all Mink will readily show the condition of the fur.

"This type of Mink is to be found more plentiful in Iowa and northern Illinois." . . .[10]

Notwithstanding its success as an aquatic animal, its feet are not webbed any more than those of the Marten and Weasel. Its chief special adaptation appears to be denser, oilier fur.

Races

The following forms have been recognized:

vison Schreber, the typical form. T. l., Eastern Canada, i. e., Quebec.

mink Peale and Beauvois, larger and more robust than *vison*, and of similar colour; but smaller and darker than *latifera*, with far less white beneath. T. l., Md.

vulgivaga Bangs, like *mink*, but smaller and paler, and of a yellowish brown. T. l., Burbridge, Plaquemines Parish, La.

energumenos Bangs, very large and dark-coloured. T. l., Sumas, B. C.

lutensis Bangs a middle-sized and pale reddish race. T. l., salt marshes off Matanzas Inlet, St. John Co., Fla.

[9] Q. N. A., I, p. 259.

[10] Hunter-Trader-Trapper, Nov., 1924, pp. 87–88.

ingens Osgood, largest of all, pale in colour. T. l., Fort Yukon, Alaska.

lacustris Preble, akin to *ingens*, but smaller and paler. T. l., Echimamish River (near Painted Stone portage), Keewatin, Canada.

melampeplus Elliott, much like *energumenos*, but darker. T. l., Kenai Peninsula, Alaska.

nesolestes Heller, in size, between *ingens* and *energumenos;* teeth very large; colours rather dark. T. l., Windfall Harbour, Admiralty Island, Alaska.

letifera Hollister, like *lacustris*, but paler and smaller. T. l., Elk River, Minn.

aestuarina Grinnell, like *energumenos*, but with lighter skull. T. l., Grizzly Island, Solano Co., Calif.

Range

The map shows that the Mink is an inhabitant of all the forested part of North America where there is permanent fresh water. On the north, its limit coincides with the edge of the woods.

In Labrador, however, we are confronted by a puzzle. The whole of the forested north half of that vast wilderness is un-Minked, though abundantly supplied with streams, timber, and Mink food. Outram Bangs writes: "Low says the Mink is found only in the southern part of Labrador, seldom occurring north of East Main and Hamilton rivers. I found it very common at Lake Edward, Quebec, but have never seen a Labrador specimen."[11]

Newfoundland. "That such an aquatic animal as the Mink," says Bangs, "should be common on the Labrador coast directly opposite Newfoundland, and yet never occur upon that island, is only another excellent proof of the complete isolation of the Newfoundland mammalian fauna.

"In June, 1898, Mr. Doane went to Flower's Cove, Newfoundland, for the express purpose of ascertaining if the Mink occurred in northwestern Newfoundland. He found that it is unknown there."[12]

Anticosti. I find no record of Mink on Anticosti. Apparently it is, and always has been, wholly unknown on that island.

Queen Charlotte Islands. Although abundant on Vancouver Island, the Mink, unlike the Marten, is unknown on Queen Charlotte Islands, as well as on most of the large islands of the south Alaska Archipelago. Never-

[11] Mamm. Lab., Am. Nat., 1898, p. 504.

[12] Mamm. Black Bay, Lab., 1899, p. 17.

MAP X.—RANGES OF MINK AND (extinct) SEA-MINK
By E. T. Seton, with assistance of the Biological Survey

theless, it is recorded by Heller for Disc Island, Hinchinbrook, Knight, and Eleanor in Prince William Sound. These islands are separated from the mainland by less than 5 miles of open water.[13]

Haunts

No two animals can have exactly the same environment. The environment is the mould into which the vital, plastic, and dynamic entity is poured by the unknown power; and if two had the same mould, they would of necessity be the same animal. It is well worth our while to study the minute circumstances which contributed their mite of impingement on the projected responsive being, gave it dint or wrinkle, and made it different from others of its near kin.

The Otter is a Weasel feeding on flesh in the water.

The Long-tailed Weasel is a Weasel feeding on flesh on the land.

The Mink is a Weasel feeding on flesh on the margin betwixt land and water—between its two kinsmen. Although it can live in the water and catch fish, like the Otter, it can also hunt on the land like the Weasel, following its prey into cover of rushes and woods, pursuing it over logs, into burrows, and occasionally even climbing up some sloping tree to get a better view of the situation. Nevertheless, it must be admitted that on the land it is as inferior to the Long-tailed Weasel as in the water it is to the Otter, and many of its meals are of a kind that either of its cousins would despise, being neither fish, flesh, nor fowl.

Home Range

The home range or locality of each individual is probably very large for so small an animal. Its habit seems to be that of all Weasels; it hunts a given area till the game grows scarce by destruction or flight, then it moves on a mile or two, along stream or overland, in search of new hunting grounds. In this way, it will change many times during a season, but always, I believe, keeping within a well-defined area that it knows and considers its range.

Judging from the time a Mink needs to get back to a given point, I should say its home range was less than 5 miles in diameter, and that it did not by any means occupy this to the exclusion of others of its kind. These individual ranges may overlap like a number of rings thrown at random on the ground, and will be most numerous where food is most abundant.

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[13] Alex. Alaska Exped., Univ. Calif., 1910, p. 345.

Within this chosen area, as H. Preston, the trapper, remarks: "A Mink is liable to go anywhere, and just as liable not to." So, "If you don't see signs of Mink, don't always get the idea that no Mink travel the place, because Mink can travel without leaving any noticeable signs."[14]

To which I should add: Keep a lookout for the little card-trays along brooksides on stones, logs, or roots, for these small dung-piles will surely tell if this be on a Mink's range.

Doctor Merriam makes some remarks that bear on this topic: "I find that many hunters and trappers believe that the Mink does not make long journeys, but remains in the vicinity of its nest, to which it returns every twenty-four hours or thereabouts. My experience, in certain cases, at least proved the contrary.

"On the banks of a stream, along which I once had a line of traps, I noticed, at intervals of two or three weeks, the tracks of an unusually large Mink. After a long while, I succeeded in tracking him to an old bridge, in a pasture, and on lifting the planks at one end discovered his nest (or one of them). It consisted of a mass of dead leaves, a foot or more in thickness, well lined with feathers. Alongside it were the remains of a Muskrat, a Red-squirrel, and a downy woodpecker, but the Mink was not there—he had gone on up the stream. Concealing a good Newhouse steel strap in the approach to his nest, I replaced the old planks and went away. This was about the middle of October.

"Two weeks passed without any indication of his return, but the time had arrived when he might be expected to 'happen around' almost any day. I therefore made daily visits to the stream to search for his tracks, taking care to avoid the immediate neighbourhood of the bridge. A heavy snowstorm now set in, and next morning a foot of newly fallen snow covered the ground. During this storm the Mink returned and was caught. He was the largest and handsomest Mink I have ever seen, and I regret to have lost the record of his dimensions, taken at the time. Some idea, however, of his size and the quality of his fur, may be had from the fact that his pelt sold for fourteen dollars.

"This and other more or less similar experiences have convinced me that the Mink frequently, if not commonly, makes long excursions like the Otter, following one water course and then another, and returning over the same route, and I believe that they have a number of nests scattered at convenient intervals along these circuits. This habit may be confined to the old males, but whether it is so or not remains to be proven."[15]

[14] Hunter-Trader-Trapper, Nov., 1924, p. 67.

[15] Mamm. Adir., pp. 65–66.

PLATE LXXXI.—THE MINK AND HIS PREY
Drawing loaned by New York Zoölogical Society

PLATE LXXXII.—MINK PHOTOS
By E. T. S.

Migration

During October and November, I have sometimes thought I saw signs of migration among the Mink, but it was quite erratic, and may have been nothing more than the general rush for good places in which to settle for the winter, before the frost imposed on them a marked change in life. At this time, I have often seen them out on the open prairie, or in the daytime, far from cover. At one or two farmhouses near Carberry, Manitoba, where I learned that Mink had arrived after the first snow, the tracks came from the northwest, but this may not have meant anything.

On Lake Peequo, at my home, Greenwich, Conn., I have seen more wild Mink than during all my Western life; partly because they are protected in a place abounding with food, and partly because I have such good opportunities to observe. Opposite my study window is the open lake with two islands that divide the breadth. Many times, especially in late summer, I have seen Mink crossing here as though it were a regular route. They do not travel by water when they can go by land, and nearly all noted were going from northeast to southwest.

Writing of the Pacific Mink, as he saw it in British Columbia, Allan Brooks says they "seem to have regular migrations, being much more common on the smaller brooks and streams in spring and summer than in winter. As the winter comes on, they move down to the larger streams and lakes and to the seacoast, returning to the small streams in the spring."[16]

Fur and Numbers

The fur of the Mink is a staple of the trade; it is a close, strong, beautiful fur, of great durability. Its market value varies much with the caprices of fashion, but has steadily gone up for the last 100 years.

In Richardson's day, 1823–27, according to that naturalist, "the fur of the Vison is of little value, and at many of the remote parts, their skins are taken by the traders from the Indians merely to accommodate the latter, but are afterward burnt, as they will not repay the expense of carriage. The fur, however, is very fine, although short, and is likely, in the revolutions of fashion, to become valuable again."[17]

In Bachman's time, the tide had turned but little, for he says: "They sold for about 50 cents each."[18] The high-water mark for Mink was about 1919–20, when prime dark skins brought from $5 to $20, with an average

[16] Recreation, May, 1900, p. 355.

[17] F. B. A., I, p. 49.

[18] Q. N. A., I, p. 259.

for the whole Canadian catch of $13.48, and a high record of $75 each, during the fur boom of 1920.

The Mink is a cased pelt. It is prime from the first of November to the first of April. It is unlawful to trap or destroy them at any other time.

The Mink is one of our most plentiful fur-bearers.

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 3,503,660 skins of this species, an average of 41,219 for each year. The lowest was 4,549 in 1822; the highest, 90,080 in 1876. The average for the 10 years, 1895 to 1905, was 57,729.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 7,993,719 skins were taken by the other American companies, an average of 112,587 each year. So that the average annual catch of Mink for fur is about 154,000—one third from the British Dominions, and two thirds from the United States.

The Official Reports of Ottawa show that in the seasons of 1919–20 to 1923–24, the number of Mink pelts marketed in Canada were respectively: 126,254; 117,561; 205,324; 159,626; 219,641.

Ontario, being the most productive of the provinces, heads the list in 1923–24 with a total of 89,143 Mink pelts, with an average value of $9.34 per pelt.

In view of the foregoing, we are safe in doubling these figures to represent the total annual catch; 400,000 is justified as an estimate.

Yet I cannot learn that Mink are being trapped out. During the autumn of 1904, in Manitoba, I found the Mink just as plentiful as in 1882.

The annual drain in Canada of about 200,000 is not followed so far by dwindling returns. In old days, trappers got a dozen or two Mink each winter. Now we read for example, from the Adirondacks, in April, 1910, according to Raymond S. Spears: "Two trappers in the centre of the wilderness—Pashley was one of them—caught over 100 Mink in November and early December."[19]

The fur returns increase because the number of trappers is ever increasing. According to D. C. Mills, who writes on "Fur People," there are 500,000 trappers in America to-day.[20] Now the whole region is under organized contribution, and the prices paid, $5 to $10, is a guarantee that every good pelt will be marketed.

The total destruction by man is sure to be far greater than the market returns. We have seen that the market is 400,000 per annum, and the

[19] Forest & Stream, April 23, 1910, p. 656.

[20] Am. Prot. Game Assn., April, 1925, p. 16.

destruction by man is easily 500,000; i. e., one to each trapper. The total area of the Mink range is 6,000,000 square miles. Assuming 20 per cent. to be the drain that the species can and does support, this would give us a total of 2,500,000 Mink alive on the range to-day.

These figures are confirmed by the Ranger census. They estimate that the 22 National Forests of Oregon and Washington, totalling in round numbers 42,000 square miles, have a population of 18,000 Mink, according to John D. Guthrie.[21] That is, about 1 Mink to each $2\frac{1}{2}$ square miles. This ratio, applied to the whole range, would also give a total of 2,500,000 Mink as the present population.

As my previous guess, made 20 years ago in Manitoba, was a pair to every square mile, there can be little question that the above estimate is not too high.

It is a matter of deep congratulation that the Mink, unlike the Marten, has not lost, either in territory or in numbers, during the last 100 years, so far as the returns would show.

His Way and His Gifts

The Mink is active chiefly by night. Most of his hunting is during the darkness, yet he is often seen in the daytime, and his behaviour then shows that he is quite unembarrassed by the glare. Sight is as serviceable to him as is any other of his powers, and the marvellous rapidity with which he hides in the most unpromising localities, is a matter of wonder to all who have seen him.

Many times while sitting still, never while travelling, have I been approached by a Mink. The minute I raised a hand or turned my head, he was gone, wholly disappeared from sight, under root or grass tuft, deep in the pool or stream—totally gone, in a flash, within a space of five feet.

Strength

The consummate animalism of the Mink is seen in his tireless activity, his tenacity of life, his nervous energy, his muscular strength.

Bachman writes: "The Mink is exceedingly tenacious of life, and we have found it still alive under a deadfall, with a pole lying across its body, pressed down by a weight of 150 pounds, beneath which it had been struggling for nearly 24 hours."[22]

Dr. E. Coues, in amplification, supplies memories of his Western life,

[21] Forest & Stream, Aug., 1925, pp. 472, 496.

[22] Q. N. A., I, p. 258.

as follows: "The tenacity of life of the Mink is something remarkable. It lives for many hours—in cases I have known for more than a day and a night—under the pressure of a heavy log, sufficient to hold it like a vice, and when the middle of the body was pressed perfectly flat. Nay, under one circumstance which I recall, the animal showed good fight on approach."[23]

His hunting strength is illustrated in the following incident: While duck-shooting at Swan Lake, Man., Oct. 18, 1901, H. W. O. Boger, of Brandon, shot a mallard which fell on the newly forming ice. An hour or two afterward, he saw a Mink come from the shore on the ice, which was then half an inch thick; it seized the mallard by the neck and dragged it away on the ice. Boger was 75 yards away; he shouted, but the Mink gave no heed; it dragged the duck to the rushes and disappeared with it.

Coues mentions a similar case wherein the Mink dragged a mallard half a mile to get it to its hole.[24] As a full-grown Mink weighs but two pounds, and a mallard more than three, it is as though an ordinary man had dragged a 200-pound man for half a mile, and had done it with little difficulty.

A Tree-climber

This species is not a climber in the sense that a Marten is, but it can and does occasionally go aloft. Dr. T. W. Gilbert, of Carberry, brought me a Mink that he shot out of a poplar tree at a height of 15 feet. In Minkeries, it is found that though they cannot climb on a smooth surface, they easily go up a rough tree trunk or fence.

Bachman writes: "It is generally supposed that the Mink never resorts to a tree to avoid pursuit; we have, however, witnessed one instance to the contrary. In hunting for the ruffed grouse (*T. umbellus*), we observed a little Dog that accompanied us barking at the stem of a young tree, and on looking up, perceived a Mink seated in the first fork, about 12 feet from the ground.

"Our friend, the late Doctor Wright, of Troy, informed us that whilst he was walking on the border of a wood, near a stream, a small animal which he supposed to be a black Squirrel, rushed from a tuft of grass and ascended a tree. After gaining a seat on a projecting branch, it peeped down at the intruder on its haunts, when he shot it, and picking it up, ascertained that it was a Mink.

"We think, however, that this animal is not often seen to ascend a

[23] Fur-bearing, p. 175.

[24] Fur-bearing, p. 179.

tree, and these are the only instances of its doing so which are known to us."[25]

McClintock says: "Personally, I believe the Mink to be a rather good climber. Of course, it does not have such sharp claws as a Cat, for instance; but it is a pretty smooth tree that a Mink cannot climb. I have been told by an experienced woodsman that he has seen a Mink coming down out of a tree with a Squirrel in its mouth."

The Power of His Smell

All of the Weasels have anal glands, which give off a very strong and more or less offensive smell when the animal is excited. The Skunk, of course, is the grand master in this department, but the armament of the Mink is not to be despised. It cannot squirt its liquid musk out to a distance as can the Skunk, but it can and does pour forth a loathsome plenty when the proper occasion has, in its opinion, arrived; and this is, whenever it considers itself in peril of its life, or is suffering grievous bodily harm, or enraged against a rival, or struggling in a trap, or, indeed, under any intense excitement.

Bachman relates: "This species, as well as the Skunk and the Ermine, emits an offensive odour when attacked by men or Dogs, and this habit is exercised likewise in a moderate degree whenever it is engaged in any severe struggle with an animal or bird on which it has seized. We were once attracted by the peculiar and well-known plaintive cry of a Hare, in a marsh on the side of one of our Southern ricefields, and our olfactories were at the same time regaled with the strong fetid odour of the Mink; we found it in possession of a large Marsh-hare with which, from the appearance of the trampled grass and mud, it had been engaged in a fierce struggle for some time."[26]

Merriam considers it a more unbearable stench than that of the Skunk, and adds: "It is the most execrable smell with which my nostrils have as yet been offended, and is more powerful and offensive in some individuals than in others—the difference probably depending upon season and age. In one specimen, the fetor was so intolerably rank and loathsome that I was unable to skin it at one sitting, and, I am free to confess, it is one of the few substances of animal, vegetable, or mineral origin that have, on land or sea, rendered me aware of the existence of the abominable sensation called *nausea*."[27]

[25] Q. N. A., I, p. 257.

[26] Q. N. A., I, p. 258.

[27] Mamm. Adir., p. 67.

That the musk has a place in the creature's news code, there can be no question. H. Preston, telling of his trapping experiences, says: "I never caught more than one Mink at a place the same season. They all seemed to make a détour of the place after one left its musk. Just the other way with Muskrat; the more I caught at a place, the better it got."[28]

Speed, Ashore and Afloat

I have several times run after Mink on the open prairies, and found it quite easy to overtake them. From this I should estimate their best speed on land at 7 or 8 miles an hour. Their bounds in ordinary travelling are from 10 to 15 inches clear. Though easily overtaken, catching them is quite a different matter, for they dodge with marvellous adroitness; and they are quick, too, at reading the little nature fingerposts that tell which way to run for a Badger hole or other haven in the earth.

On Oct. 3, 1884, while following a Mink through the snow in the Sandhills south of Carberry, I came to where it had tobogganed itself down a long hill for a distance of 18 feet, after the manner of an Otter.

At Lake Peequo, Greenwich, Conn., Nov. 11, 1921, I watched a Mink swim from an island to the shore (65 yards measured) in exactly 75 seconds, that is, a little less than 2 miles an hour. As he landed, a Dog approached and scared him off; he swam back to the island in much less time, although he did most of it under water in 10-foot dives.

Therefore, in the water, I should estimate its best travelling speed at 1 to 1½ miles an hour. This is not reckoning the dive or underwater spring that it can and must make to catch fish. It is much swifter than the Muskrat, but apparently cannot dive so far. I once saw a young male Mink hunted down among some floating logs. He might have escaped had he dived and swum 50 feet to the cover along shore; but he did not, apparently because he could not swim so far under water.

At the same lake, I surprised a Mink on a small bridge. It jumped into the water, dived, and in clear view, swam below the surface to a bunch of rushes 45 feet away. So that this distance, at least, was within its powers.

Thomas Anderson, the fur-trader at Fort Smith, said that, according to his observations, a Mink could swim 30 yards under water, but never more.

Allan Brooks writes, concerning the Pacific Mink: "I have seen this Mink chasing a Muskrat in clear water. Both animals were travelling at a great rate, about 8 inches under the surface. To my surprise, the Mink easily overhauled the Rat, and would have killed it, had I not interfered."[29]

[28] Hunter-Trader-Trapper, Nov., 1924, p. 67.

[29] Recreation, May, 1900, p. 355.

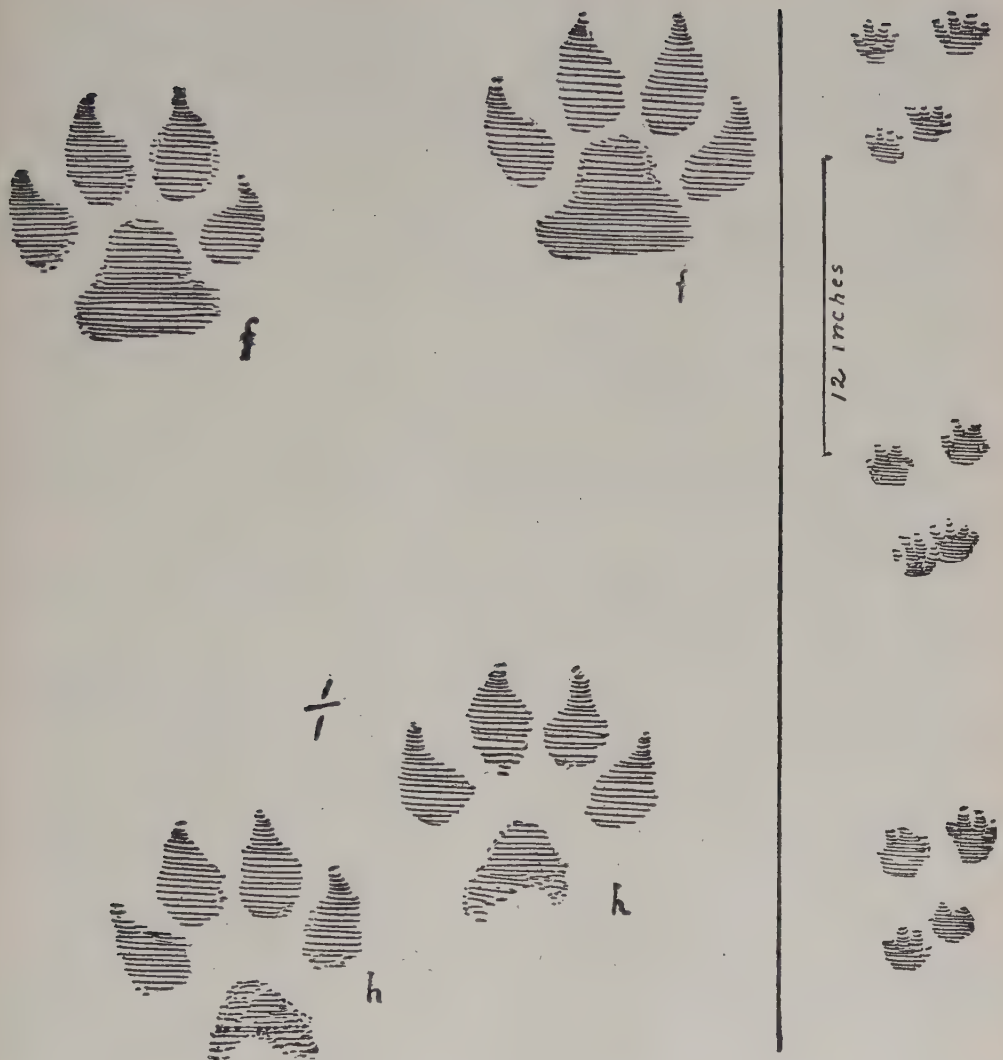

PLATE LXXXIII.—MINK TRACKS

Winnipegosis, Man., Sept. 2, 1904

The four large ones are exactly life size, and were made by a very large Mink. Only four toes show in each, though it has five toes on each foot.

The small series on the right show the ordinary speeding gait of the Mink: about 12 inches is covered at each bound.

His Deep Sleep

Among the captives in my Minkery, I have noticed a strange habit, not elsewhere recorded; that is, of sleeping so soundly at times that it looks like a sleep of death. The dens are so arranged that I can silently lift a lid and see the Mink at rest. Many times I have done so, and had to poke him with a stick several times before he awoke, and in a flash was gone. This same death-like torpor I have seen in the Weasel, so that the proverb about catching a Weasel asleep is open to revision.

Marriage Customs

In Manitoba, and indeed, throughout Canada, mating takes place in March and may extend even into mid-April.

Major L. D. McClintock of the Knowlton, Que., Minkeries, writes: "The mating season for Minks is supposed to run from about the third week in February till about the end of March, but most Minks mate in the first two weeks of March."[30]

We are told, further, that the females in the Resseque Minkery "come in heat with great regularity, all being ready for the male within ten days, and the period of excitement lasts about four days."[31]

The following from the pen of Bachman illustrates their habits in the wild state at this season: "The latter end of February or the beginning of March in the latitude of Albany, N. Y., is the rutting season of the Mink. At this period the ground is usually still covered with snow, but the male is, notwithstanding, very restless; and his tracks may everywhere be traced along ponds, among the slabs around sawmills, and along nearly every stream of water. He seems to keep on foot all day as well as through the whole night. Having for several days in succession observed a number of Minks on the ice, hurrying up and down a mill-pond, where we had not observed any during the whole winter, we took a position near a place which we had seen them pass, in order to procure some of them. We shot six in the course of the morning, and ascertained that they were all large and old males. As we did not find a single female in a week, whilst we obtained a great number of males, we came to the conclusion that the females during this period remain in their burrows."[32]

Evidently the custom of New Year's calling is established among the Minks. The ladies were at home receiving; the gentlemen felt bound to

[30] Raising Mink for Profit, p. 9.

[31] Fur-bearing, p. 182.

[32] Q. N. A., I, p. 258.

make as many calls as possible, hoping in each case to have the parlour to himself; or, in any case, ready to fight for it, if need be.

Most naturalists believe that the Mink is polygamous, or possibly polyandrous. Thus Kennicott says: "The Mink is not at all gregarious, and does not even live in pairs. During the love season, which occurs in February or March, according to the climate, the female is accompanied by one or more males."[33]

The fact, recorded by many observers, that during the mating season the males fight desperately to a finish, is directly opposed to any theory of polyandry. Since polyandry presupposes an amiable acceptance of the arrangement by all the males concerned, there is much more satisfactory evidence pointing to polygamy. In all the numerous Mink ranches from Resseque's to the present, it has been found easy and desirable to mate 1 male with from 2 to 6 or 8 females.

Thus McClintock writes: "As regards the number of females that can normally be mated to 1 male, there is some difference of opinion. Some breeders claim that 1 male to 4 or 5 females is about right. Others go to the other extreme, and mate their Minks in pairs. The majority of experienced breeders, however, seem to favour mating 1 male to about 2 or 3 females on an average."[34]

This, it will be remembered, was found to be impracticable with Foxes, because their whole tradition is for monogamy.

If two adults are seen together with the brood, or during the younging time, it is some evidence of monogamy. Many observers have seen Minks in pairs together, sharing each other's lives and fortunes to some extent.

Thus, Charles G. D. Roberts tells me that one year about midsummer, as he was carrying his canoe around a log jam on the Nashwaak River, N. B., he saw 2 full-grown Mink travelling together, and evidently associated. They left the log jam just as he had done, to travel down the bank; as they came near, he stood still to watch them. One ran by him and over his foot; the other, a large one that he took to be the male, ran past, some 10 feet aside. Beyond him, they resumed their journey, and took to the water again some 40 yards below.

In 1913, when I visited Wallace Evans's Game Farm near Chicago, I learned that Mink were abundant in that region. His men captured many that were raiding the pheasant runs. He assured me that he had seen a family of young Mink in June with 2 adults caring for them.

Finally, we are told that in the Caneadea, N. Y., Minkery: "About

[33] Quads. Ill., p. 102.

[34] Raising Mink for Profit, p. 9.

the middle of March the females are separated from the males until the young are reared. The necessity for this arises from the fact that the males seem inclined to brood the young almost as much as the dam, when both are permitted to remain together."[35]

This is strong evidence that, in a state of nature, the male Mink is a model father; which necessitates that he be also a faithful mate.

L. D. McClintock says: "In cases where two parents look after the young, I am of the opinion that it is a case where a brother and sister have run together from kittenhood, and continue together throughout the mating season, probably in a section where other Minks are scarce."[36]

In the vast majority of cases recorded, however, the female was alone when caring for her litter. The weight of present evidence, then, is that the Mink is polygamous.

The Rival Males

When Mink meets Mink, the battle is worthy of such desperate and valiant warriors. They meet much and often at certain seasons; so that it is surprising how few have witnessed the deadly engagement. The following description is that of a man who beheld it with his own eyes:

"It was my good fortune to witness a fight to death between a couple of male Minks a fortnight ago, one of the most fearless as well as silent struggles I ever saw. In one of the largest stone quarries in western Ohio, a small clear brook grows larger, deeper, and wider by the help of the clear sparkling water of many a spring, issuing from the crevices of the limestone and flowing through little hollows and around pieces of stone that have been thrown out as worthless. In the course of years, the accumulation of rubbish or 'dump,' as it is termed, has made a perfect retreat for Minks, Weasels, and Rabbits.

"Having a considerable amount of dirt in it, the quarry affords a paradise for such animals as are in the habit of burrowing close to small streams. One afternoon, as I was on my way to another block to give some instructions to my men, I accidentally glanced towards a small sandy spot running out into the stream, forming a peninsula or cape by the junction of a little brooklet and the main or larger brook. The spot was bare, with the exception of a few Spanish needles, and was overhung with small willows. Standing within six or eight feet of me were two large male Minks, eyeing each other intently, their small eyes looking like coals of fire, and with mouth slightly open, their backs arched, necks stretched forwards, their hind legs

[35] Fur-bearing, p. 184.

[36] Personal letter.

close to the ground, they looked very much like miniature Tigers waiting an opportunity to spring towards each other.

"The first motion was a quivering of the bodies, followed by increasing rapidity in breathing. Then slowly each advanced towards the other, until 18 inches apart, when each seemed to be gathering all the strength possible to make a final leap. After standing motionless for a full minute, one of them turned his head a little to the right, and instantly the other did the same. Probably 10 seconds elapsed while in this attitude when, quicker than the eye could follow, they sprang towards each other, and, catching by their throats just back of the lower jaw, held to each other with a grip that meant death to the one that should let go his hold.

"With a determination to conquer or die, they wound each other round and round until exhausted from loss of blood, when, spreading their fore feet to brace themselves, they stood perfectly still until one of them staggered, then fell, pulling the other with him, laying them both down in the sand, growing weaker and weaker until they ceased to breathe. When they were dead, I picked one of them up, and the jaws of each were so set that it was with difficulty I pulled them apart. The battle was probably of a minute's duration, in which time the animals never noticed my presence, or, if they did, they made no sign of their knowledge of it. I presume the object was for one to catch the other so close to his lower jaw that he could get no hold upon his enemy's throat, when a very short time would decide the battle."[37]

Den and Nest

There is hardly any type of low situation near the water where a Mink will not make its den. Long burrows in banks, holes under logs, stumps or roots, and hollow trees are favourite places, but crevices of rocks, drains, and nooks under stone piles and bridges are frequently selected.

If the burrow is one dug by the animal itself, it is about 4 inches in diameter, and if in ordinarily easy digging, it may continue along for 10 or 12 feet at a depth of 2 or 3 feet.

On the prairie, Kennicott found the Minks "living in burrows, often 6 or 8 rods in length, on high ground, from which long galleries extend to the edge of a slough or pond. These galleries, however, are not formed by the Minks, but by Muskrats, which dig them in order to place their nests beyond the reach of high water and yet have subterranean communication with the stream."[38]

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[37] Williamsburgh, Ind., Forest & Stream, Nov. 24, 1892, p. 444.

[38] Quads. Ill., p. 102.

Similarly, Kennicott credits it with occupying the burrows of the Badger and the Skunk when in a suitable locality, and finally with frequently digging dens in old ant-hills, presumably because these are dry elevations near the water.

At the end of the long, crooked, 4-inch tunnel is the nest, or nursery den, of the family. This is usually described as a chamber about a foot in diameter, warm and dry, and well lined with fine grass, feathers, and any other soft material that is handy.

Sometimes the nest is in a Muskrat home, whose rightful owners have been dispossessed, probably eaten; but the lining and finish are said to be the same as in the underground den. So far as known, it is made and guarded solely by the mother.

The male, however, has a den of his own, probably a number of them, scattered over his home range, as already noted. Indeed, it is tolerably certain that at all seasons, each Mink has one or two refuge dens at convenient parts of its home region, where he or she can count on a comfortable nest, no matter what weather may be in possession of the outside world.

The Young: Bearing and Borning

According to most authorities, the period of gestation is normally 42 days. McClintock, after years of experience, writes me: "I have a theory which may or may not be worth anything. It is to the effect that some Minks are quite normally born in a more advanced state than are others. This would partly account for the wide range in variation of gestation periods, namely from about 42 days to 60 days or more."[39]

In Manitoba, the young are born about the last week in April or first of May. They are usually 5 or 6 in number, but may vary from 3 to 10. I have, however, seen a litter of but 2.

Roderick MacFarlane offers some significant observations on this point. "I have also been assured," he says, "that where the food conditions are very good, instances of as many as 8, 10, and even 12, have been observed. In this connection, I would remark that Indians in different parts of this vast country have asserted that when the several periodical fur-bearing animals are at a minimum stage, the births are few, but that these augment annually in number during the seasons of increase. This rather remarkable, but probable circumstance, applies particularly to Musquash, Martens, Minks, Ermines, Foxes, and Skunks. A number of hunters have also said

[39] Personal letter, Aug. 1, 1925.

to me that they have sometimes noticed this peculiarity in the case of Beaver."[40]

On arrival, they are about the size and shape of one's little finger, pale in colour, blind, naked, and helpless.

At what age their eyes open is not certain. I find great diversity of opinion among those who ought to know. W. B. Lamb says "at about 8 to 10 days." H. Resseque says 5 weeks. Major L. D. McClintock writes me: "Concerning the age at which young Minks have their eyes open, to the best of my recollection, mine have varied in this particular between the ages of 24 days and 31 days," that is, $3\frac{1}{2}$ to 4 weeks.

This long sightless period closely parallels that of the Marten, which is 4 weeks.

Now the little creatures begin to look like Mink, for they are covered with a close fine coat of fur.

On June 28, 1883, I found a young Mink lying under some brush on a sort of trail between two ponds among the Sandhills, near Carberry. I was led to it by its plaintive squeaking. It was well formed, but its eyes were not open, and I saw nothing of the mother or of any other young Mink. Why it was there is a puzzle, as this did not seem to be a nest. Possibly the mother was moving her brood to new quarters and left this in a temporary resting place. I carried it home. Its eyes opened about July 1st. Reckoning backward, this one must have been born about May 29th, and engendered in mid-April.

About the time their eyes open, the mother begins to supply them with solid food.

Going Forth to See the World

As late as June 28th they are still in the nest with the mother in the country about Methy Lake, as evidenced by a note in Richardson's last "Journey": "A female Mink (*Vison lutreola*) was killed as it was crossing a bay of the lake. It had 8 swollen teats and its udder contained milk; so that probably its death insured that of a young progeny also."[41]

When 6 or 8 weeks old, that is, about July 1st, the young Mink seem to abandon the nest and go forth into the world under the guardianship of the mother. At such times, she shows fight, facing the intruder and uttering a snarling screech; the young, meanwhile, escape to the water.

One of my Kippewa guides, Archie Miller, relates that in a great forest fire near Temiscaming Lake, in July, 1901, he saw an old Mink with her 4

[40] Mamm. Northern Canada, 1908, p. 210.

[41] Arc. Search Exp., 1851, I, p. 109.

young, swimming up a creek towards the lake. The woods were blazing on both sides, and they were travelling upstream to escape, coming up for a breath, then diving and swimming under. They were hard pressed, nearly worn out indeed, and could not swim more than 25 feet without coming up. They were the size of a Red-squirrel. Only *one* parent was seen.

Another guide, Edouard C. Crête, contributes some interesting observations on their home life. He says that one year he was staying at a hay camp, 11 miles west of Deux Rivières, Ont., from July 12th to 22d. Every day, for a week at least, after the 15th, an old Mink came with 5 young ones to feed on the rubbish thrown out. They were there twice a day, morning and evening, regularly, until he went away.

The following, by Prof. C. L. Webster, is a graphic picture of the mother's life and labours for her young at this season:

"While engaged in geological work on the Cedar River, near Osage, Ia., my attention was attracted by the peculiar actions of a Mink (*Putorius vison*). By careful manœuvring, we were enabled to approach to within a short distance of where it was engaged, and there watch its behaviour unobserved. It was an old mother Mink engaged in fishing for her young. On the ripples in the centre of the stream, where the water was not more than 2 feet in depth, was a flat drift boulder rising a few inches above the surface. On this rock the mother Mink would take her position, and here watch for small fish to approach, when she would dive into the water, be gone for a moment, and then reappear on the opposite side of the rock, usually with a fish in her mouth, which she would deposit in the centre of the stone, and its struggles instantly stopped by a quick, sharp bite at the back of the head, which caused immediate death. This process was repeated without intermission, except to stop for an instant to shake the water from her furry coat, until 7 fish, varying from 4 to 7 inches in length, were deposited on the rock. Then, without stopping to rest, taking one fish in her mouth, she plunged into the water and swam ashore, climbed up the steep bank, and ran hastily to her young, in a burrow under an old stump on the bank of the stream, 50 yards away.

"In a moment she was seen returning, plunged into the stream and swam to the rock, took a second fish in her mouth, entered the river once more, and returned to her young as at first. This was repeated until all the fish had been carried away. A few moments after having removed the last fish, she returned and began her work once more. This time, however, her labours were without result, so, shifting her position to another rock in the stream, a short distance away, she continued her fishing. But, although

more than a quarter of an hour was spent in energetic effort, her labours were without avail, and she was this time compelled to return to her young empty-handed.

"From the bank of the stream, where egress from the water was made, to the burrow fifty yards distant, a well-beaten path had been formed by the mother Mink in her daily excursions in quest of food for her young."[42]

Yet another interesting glimpse of the family life is furnished me by A. Barton Hepburn, of New York. When he was a boy living on the home farm at Colton, N. Y., he was going with his father one day late in June, across an alder brook by the road bridge, when they saw in the bushes to one side an old Mink with 5 young ones that were about one quarter grown. They were following her, but when they came to the road, they held back and would not quit the cover to cross the road. She made several efforts to coax and lead them on, but they were timid. At length, she seemed to lose patience; she seized them, one at a time, by the neck, and so carried them across to the opposite thicket, where they continued their journey. He saw nothing of the father Mink and does not remember whether or not the mother made any sounds.

The purser of the Hudson's Bay Company steamer gave me the following incident. It illustrates the devotion of the mother Mink. She could easily have escaped, but preferred to face death, and so successfully cover the retreat of her brood. "In early June, 1903, when the *Graham* was tied up at Chipewyan, I saw an old Mink with 4 young ones about the dock. We killed the old one; the little ones, though but half grown, escaped. They uttered a sort of shrill screeching before disappearing."

Does it not also show up the senseless brutality of the men—their lust for destruction? The Mink was doing no harm to any one, its pelt was not worth preserving at that time, her heroic efforts to save her young elicited no spark of admiration. Such are the men who have robbed the West of its glorious animal life.

The little ones continue with the mother until the middle of August. They have now learned something of the ways of life. The family breaks up, and henceforth all are seen wandering alone. They are now about half grown in point of weight. As usual, the females mature sooner. We learn from Resseque that they attain their full stature in ten months and reproduce when one year old, "while the males are not full grown until they are a year and a half old. It is noted that in every litter, one or the other sex

[42] American Naturalist, March, 1889, p. 176.

predominates in numbers, there being rarely half of them males and the other half females."[43]

There is but one brood each season.

The Food of an Omnivore

There be few of the creatures whose Lives appear in this volume or the preceding, to whom chicken—young, fresh, hot, bleeding chicken—is not the climax of alimentary joy; and fewer still there be who do not consider that the whole world owes them a living.

No better setting forth of this in terms of Mink has so far been offered than that by Bachman. His account has, further, the advantages of being original, picturesque, and complete, and the great disadvantage of being in a book so rare and costly that few can see it. I therefore reproduce it, and remind the reader that Bachman knew the Mink in all the country from Albany, N. Y., to the Ohio and south to the Carolinas; or, in his own words, "we have seen it in every State of the Union,"[44] which, in his day, the 'forties, meant all east of the Mississippi. He says:

"We acknowledge that we have little inclination to say anything in defence of the Mink. We must admit, however, that although he is a cunning and destructive rogue, his next-door neighbour, the Ermine or Common Weasel, goes infinitely beyond him in his mischievous propensities. Whilst the Mink is satisfied with destroying one or two fowls at a time, on which he makes a hearty meal; the Weasel, in the very spirit of wanton destructiveness, sometimes in a single night puts to death every tenant of the poultry house!

"Whilst residing at Henderson, on the banks of the Ohio River, we observed that Minks were quite abundant, and often saw them carrying off Rats which they caught like the Weasel or Ferret, and conveyed away in their mouths, holding them by the neck in the manner of a Cat.

"Along the trout streams of our Eastern and Northern States, the Mink has been known to steal fish that, having been caught by some angler, had been left tied together with a string while the fisherman proceeded farther in quest of more. An angler informed us that he had lost in this way 30 or 40 fine trout, which a Mink dragged off the bank into the stream and devoured, and we have been told that by looking carefully after them, the Minks could be seen watching the fisherman and in readiness to take his fish, should be leave it at any distance behind him. Mr. Hutson of

[43] Fur-bearing, p. 182.

[44] Q. N. A., I, p. 259.

Halifax informed us that he had a salmon weighing 4 pounds carried off by one of them.

"We have observed that the Mink is a tolerably expert fisher. On one occasion, whilst seated near a trout brook in the northern part of the State of New York, we heard a sudden splashing in the stream and saw a large trout gliding through the shallow water and making for some long overhanging roots on the side of the bank. A Mink was in close pursuit, and dived after it; in a moment afterwards, it reappeared with the fish in its mouth. By a sudden rush, we induced it to drop the trout, which was upwards of a foot in length.

"We are disposed to believe, however, that fishes are not the principal food on which the Mink subsists. We have sometimes seen it feeding on frogs and crayfish. In the Northern States, we have often observed it with a Wilson's Meadowmouse in its mouth, and in Carolina, the very common Cotton-rat furnishes no small proportion of its food. We have frequently remarked it coursing along the edges of the marshes, and found that it was in search of this Rat, which frequents such localities, and we discovered that it was not an unsuccessful mouser. We once saw a Mink issuing from a hole in the earth, dragging by the neck a large Florida Rat.

"This species has a good nose, and is able to pursue its prey like a hound following a Deer. A friend of ours informed us that once, while standing on the border of a swamp near the Ashley River, he perceived a Marsh Hare dashing by him; a moment after came a Mink with its nose near the ground, following the frightened animal, apparently by the scent, through the marsh.

"In the vicinity of Charleston, South Carolina, a hen-house was one season robbed several nights in succession, the owner counting a chicken less every morning. No idea could be formed, however, of the manner in which it was carried off. The building was erected on posts, and was securely locked, in addition to which precaution a very vigilant watchdog was now put on guard, being chained underneath the chicken-house. Still, the number of fowls in it diminished nightly and one was, as before, missed every morning.

"We were at last requested to endeavour to ascertain the cause of the vexatious and singular abstraction of our friend's chickens, and on a careful examination we discovered a small hole in a corner of the building, leading to a cavity between the weather-boarding and the sill. On gently forcing outward a plank, we perceived the bright eyes of a Mink peering at us and shining like a pair of diamonds. He had long been thus snugly ensconced and was enabled to supply himself with a regular feast without leaving the

house, as the hole opened toward the inside on the floor. Summary justice was inflicted, of course, on the concealed robber, and peace and security once more were restored in the precincts of the chicken-yard.

"This species is very numerous in the salt-marshes of the Southern States, where it subsists principally on the marsh-hen (*Rallus crepitans*), the sea-side finch (*Ammodramus maritimus*), and the sharp-tailed finch (*A. caudacutus*), which, during a considerable portion of the year, feed on the minute shell-fish and aquatic insects left on the mud and oyster-banks, on the subsiding of the waters. We have seen a Mink winding stealthily through the tall marsh-grass, pausing occasionally to take an observation, and sometimes lying for the space of a minute flat upon the mud: at length it draws its hind feet far forwards under its body in the manner of a Cat, its back is arched, its tail curled, and it makes a sudden spring. The screams of a captured marsh-hen succeed, and its up-raised fluttering wing gives sufficient evidence that it is about to be transferred from its pleasant haunts in the marshes to the capacious maw of the hungry Mink."[45]

Robert Kennicott, the Illinois naturalist, after devoting some lines to abuse of the Cottontail for its raids on garden truck, says:

"In one instance, within my observation, a Mink did good service, and amply paid for the two or three fowls he consumed, by ridding a farm-yard of several Rabbits which had thus taken up their quarters under the barn and haystacks, and were making sad havoc among some choice plants in the flower garden. As long as the Mink remained, no Rabbits were observed on the premises, though before and after his visit, their tracks were seen in every direction, despite the presence of two Dogs accustomed to hunting. Where Rabbits are troublesome, and no fowls are kept, the presence of Minks and Weasels is desirable."[46]

William Brewster, the well-known naturalist of Cambridge, Mass., once told me a sad chapter of bird-life in which, I fear, the villain was a Mink. Brewster was interested in watching a small colony of bank swallows that had established their home a little too low. One morning he found that every nest had been rifled and destroyed; while the tracks about told only too plainly that a Mink had been very busy the night before.

This is a bad count against the Mink, and yet one is tempted to say, "Serve the swallows right for nesting so low." Another time they will be wiser.

Merriam tells, as we have seen, of finding a downy woodpecker in the larder of a Mink. Light on the method of taking such a difficult prey is

[45] Q. N. A., I, pp. 254–56.

[46] Quads. Ill., p. 84.

Mink poses (from life)
Winnipeg, Aug. 24, 1904

Mink about one fifth of life size
From pen drawing made by E. T. Seton for the Department of Agriculture in 1888.
Published in the Report of the Ornithologist and Mammologist, 1889, p. 488

Young Mink ♂ (life size)
Desbarats, Ont., Aug. 17, 1904

Right paws of young Mink ♂
(life size)
Desbarats, Ont., Aug. 17, 1904

PLATE LXXXV.—MINK DETAILS

contained in the following by Ed. Chas. Hobson of Lowell, Mass. He was following a Mink trail, and writes: "Downstream a bit, the brook widened; the ground became marshy and hummocky. In the centre of a clearing stood an old hemlock, broken off some fifteen feet above the ground. In the upper end of this relic, the openings of a number of woodpecker holes appeared. The Mink left the brook, and in a number of leaps, came to the base of the trunk. Bits of bark on the snow showed it had climbed up to explore those holes for an unlucky downy or hairy woodpecker."[47]

After chicken, wild and tame, fish are perhaps the Mink's choicest food, and it delights in taking them by open pursuit in the clear water. Although it is inferior to the Otter in this craft, Bachman records, as we have noted, that he has seen one catch a trout a foot long.[48] A quadruped that can catch a trout of that size can catch anything that swims in the smaller streams. Those that live along the prairie sloughs feed chiefly on frogs, tadpoles, Mice, and Muskrats. The latter it follows under water into their burrows or their homes, killing and devouring them in spite of a most desperate resistance. The Muskrat is a noted fighter and always dies game: still, it dies when it meets the Mink.

Dr. E. Coues thus condenses M. A. Howell, Jr.'s account of a Muskrat-Mink adventure: "Whilst snipe-hunting on a marshy island below the Kickapoo Rapids of the Illinois River, the writer noticed an object which appeared like a ball some 6 or 8 inches in diameter, rolling towards the water, and soon ascertained that it was a Mink and a Muskrat clinched together, and so completely covered with mud as not to have been at first recognized. At his approach, the Mink released its hold and made its escape, but the Muskrat was already dying of severe wounds in the head and neck, from which the blood was flowing profusely. The Muskrat had evidently been captured and overcome in fair fight by broad daylight, and the Mink would have devoured its victim, had not the hunter interfered."[49]

E. W. Deming, the New York animal-painter, informs me that on Green River, of Illinois, the Muskrat is a regular food of the Mink. He once found the remains of 10 Muskrats in a Mink den. This is a typical and extremely carnivorous record, but nothing in the way of flesh, fish, or fowl comes amiss.

As already set forth by Bachman, the Mink is delighted with the chance to rob the sportsman of a string of fish. One of the first drawings I made after I went to live in New York was an illustration of this very subject.

[47] Journ. Mamm., Aug., 1921, p. 169.

[48] Q. N. A., I, p. 255.

[49] Fur-bearing, p. 178.

It was called "A Mink Carnival"; it appeared in *Recreation Magazine*, for Dec., 1899, p. 416, and is reproduced herewith.

R. C. Ford, describing his August outing in Canada, of a year that is long ago now, says: "We camped that night on the bank of a small lake near the portage, which seemed full of black bass. An hour before sunset, we went out and caught about a dozen of them. We cooked two or three for dinner, and placed the rest in a small pool, from which we could easily take them without landing-nets, and where we hoped to keep them alive for breakfast; but when we went after them the next morning, we found that two or three Minks had had a glorious all-night festival on our fish, and had left nothing of them but the heads and tails."

In similar tenor, one of the old-timers of *Forest & Stream* (W. M. D.) writes:

"We were spending our vacation in the woods of Maine, fishing, and travelling about for a good time in general. One day we came across an old dam made to flood a piece of lowland. As this looked like a good place to fish, we stopped, seated ourselves upon the edge of the dam, and cast in our line. The fish were quite plenty, and as fast as we caught one, we threw it behind us upon the scaffolding. After a dozen or so had been caught, I thought I would light my pipe, pick up the fish and put them in the shade, and I started to do so. I accomplished the first object, but upon looking for the fish, I could not find a single one. I thought that my chum must have removed them and was playing a joke upon me, but on mentioning it to him, he was as much surprised as I was. They could not have fallen through the cracks, nor leaped over the side without our knowing it. Where were they? That was the question. He returned to fish, and I seated myself on the bank to digest the subject. Presently he caught another fish, and threw it upon the boards. Immediately I saw a Mink run out from a hole near by, snatch the fish, and carry it off. This explained the mysterious disappearance of the others."[50]

To this, Charles Hallock, the founder and editor of *Forest & Stream*, adds: "We have had lake trout weighing 12 pounds apiece, carried off by Minks, and dragged to their holes in the bank, when their size prevented their being drawn in."

The duck-gunners, too, are often laid under contribution by the water-wise Mink. Many a wounded or dead duck has disappeared strangely, never to be found by Dog or man. But a Mink might have explained the mystery. In some cases, indeed, he has been known to seize a wounded duck before the gunner's very eyes, and make good his escape with a week of dinners.

[50] Forest & Stream, Jan. 11, 1877, p. 357.

During snow-time in Ontario, I have followed the track, to read the gruesome story of his running down and devouring a Gray-rabbit. From all accounts, it often amuses itself with preying on House-rats where they abound. All kinds of birds and eggs are most acceptable food when it can find them. Not rarely, it quarters itself on the hen-house, killing each night for food, and especially relishing the blood and brains of its victims.

It will prey on snakes and clams when nothing better turns up, and I have several times followed its tracks at Lake Winnipegosis to learn that frogs, crayfish, and carrion were staple articles of its diet.

A mass of Mink excrement taken at Greenwich, Conn., Dec. 1, 1921, I sent to the Biological Survey at Washington. The experts reported: "Mink excrement which you sent contained chicken bone and feathers, and fragments of two small crabs."

Summary of Food Habits

Buried in a Government Report prepared by Merriam in 1888, and for which report I made the pen sketch of the Mink on an adjoining page, is the following summary of the creature's food habits:

"As an enemy to the poultry-yard, it ranks ahead of the Weasel and all other North American mammals. Furthermore, it kills large numbers of fish, as it not only swims and dives with facility, but can remain long under water, pursuing and capturing its prey by following it below the surface. Oftentimes its destructiveness in this respect renders it a serious obstacle to the industry of fish culture. Away from the vicinity of man, it habitually feeds upon small mammals, birds and their eggs, fish, frogs, turtles' eggs, and the like. In the nest of a Mink I once found the remains of a Muskrat, a Red-squirrel, and a downy woodpecker. Its harmfulness is offset in a measure by the good it does in killing injurious rodents, particularly Muskrats and common Rats and Mice. Hence, although an acknowledged enemy to the poultry raiser and fish culturist, it is a public benefactor in localities where Muskrats damage dikes, canals, irrigating ditches, and ponds."[51]

To which I should like to add, not only is the Mink an inveterate and successful ratter and mouser, but more, the havoc it makes among the young and eggs of the snapping turtle goes a long way to balance the damage it does in the poultry-yard. Any one who has seen, as I have many times, a flock of a dozen downy wild ducks disappearing day after day till one or none is left, will have a warm place in his affections for any creature that can in any measure reduce the toll of this fearful demon of the deep.

[51] Rep. Orn. & Mamm. for 1888, pub. 1889, pp. 488–89.

Storage Habit

It is a "stepping stone to higher things" when we find in an animal the habit of storing in times of plenty against times of famine ahead. None of the dull Deer family were ever known to do such a thing, and yet most of our hunters have learned the lesson—the Mink among them.

The first illustration at hand is given by Merriam, who found, as we have seen, by the autumn nest of a solitary old Mink, "the remains of a Muskrat, a Red-squirrel, and a downy woodpecker."[52] I should much like to know the three very different chapters of hunting represented by these three captures.

The next instance is a trifle gory. It might with propriety appear in the food chapter, but that is bloody enough, and I have no wish to pile up damning evidence against a beautiful wild thing that has given me many hours of delight.

The present arraignment appears also in Merriam's "Report on the Mink," 1889. Read it, but forget the first part and remember only that here was a brave and devoted little huntress, providing for the five babies that it was her joy and burden to beget and foster.

"W. H. Head, of Bristow, Iowa, says: 'In January, 1887, a Mink visited the poultry-house of my brother, and in one night killed 18 full-grown fowls. The hen-house is about 40 rods from a large marsh where Minks are plentiful. During the past winter, my brother lost more than 100 fowls from these pests. We once set a large Cochin hen in the banking of an old straw stable. This was some time in June. Early one morning, I observed a large Mink near the stable. A few days later, I examined the nest. There was but one egg left. The next morning I went to the stable and found the hen missing. Reaching back into a hole behind the nest, and feeling the hen, I pulled her out. She was dead, with a hole in her neck, which the Mink had made to suck her blood. The next day my brother shot the Mink. We then took away the banking of the stable and found most of the eggs unbroken, and also found 5 young Minks.'"[53]

In fur-ranches, the strongly developed storage instinct of the Mink has often caused embarrassment and disease. When given more food than it can eat, the Mink hides it in his den. The result is that, unless closely watched, the den becomes a foul-smelling pile of rotten meat, producing discomfort and disease. The malady known as tail-rot is a result of this condition.

The remedies are limited food, small dens, and frequent cleansings.

[52] Rep. Orn & Mamm. for 1888, pub. 1889, pp. 488-89.

[53] As above, p. 489.

Enemies of the Mink

In the "Sea-otter," I have endeavoured to set forth the terrors of the Killer Whale among the animal life of the North Pacific. Inevadable Death is he to all things big enough to furnish him a mouthful of food. The fear of him is on all flesh.

What the Killer Whale is in the water, the great horned owl, the tiger-owl, is in the woods, among the lesser things that run or fly.

Few indeed be the enemies of the Mink, but the tiger-owl is perhaps the deadliest. Here is one of the few observations that fortify this general statement. It is related by the well-known fisherman, A. N. Cheney. A friend of his was at the opening of his tent one nightfall, at Triton Club Lake. He had been "fishing, and his trout were in front of his tent, when a Mink came from somewhere, and seizing a trout in its mouth, made off with it, but before the Mink was out of sight, a big owl swooped down, grabbed the Mink, and made off with it into the air, and the last he heard of the Mink it was screaming pitifully up towards the zenith."[54]

There was a time when Mink ranchers kept the Mink in pens without any roof but a tin overhang. But the owls found out these sheepfolds, and the dwindling numbers of the Mink, without loop-hole or track to explain, soon taught the ranchmen that the enemy was one who dropped from the sky by night. Now all Mink pens are ceiled with Mink-proof, owl-proof netting.

No doubt, the Fox and the Fisher will destroy the Mink, young or old, when they chance to meet him in the open; and in the Lynx Life is related the murder of a Mink by the big soft Cat. But the Mink is such an adept at hiding in brush, pool, rush, or grass, that these fellow hunters in fur have little bearing on his numbers.

As a rare and picturesque incident, I quote from a personal letter sent me, April 27, 1925, by E. J. Sawyer, the artist-naturalist: "At Camp Roosevelt, or rather near there, I once saw a fight between a Marmot and a Mink—honours even. This seems to me a rare thing. I mean to write it up at some early time. The sequel was also interesting. The day following the fight, I saw the Mink make a détour to avoid the Marmot.

"So earnest was the fight that, for part of it (and I saw it all), I had approached, and was looking on, as one would bend over to watch a checker game; that is, the contestants three feet from my face." As in this, the Marmot, not the Mink, was the hero, the story is more fully given in the Marmot Life, Volume IV.

Another strange adventure in which our hero met defeat, is set forth

[54] Forest & Stream, May 7, 1898, p. 371.

in the *Despatch* (St. Paul, Minn.), March 7, 1902. It credits a rooster with fighting successfully a Mink that was raiding the hen-house. The rooster was badly torn, but the Mink was blinded and dying when found.

Diseases and Sanitation

Far deadlier, no doubt, are the little foes that fester in the Mink's own skin, that dwell within and have himself as protector and host.

One species of parasite is the "kidney worm." W. M. H. repeats the account of a Maine trapper who, in skinning a Mink, found in his belly a growth that was quite hard and "full of red worms." On April 2d, he also found a small female Mink with a hard growth that "proved to be the right kidney. It was of a sickly purple, mottled with white, and corrugated, resembling the inner skin of a fowl's gizzard more than anything which comes to mind. It appeared hard to the touch. On cutting it open, we found two or three red worms at least three inches in length, and of about the diameter of a small earth-worm, somewhat rigid and with an open sucker at the end like a section of garden hose. In colour, they were of a light, but very bright scarlet, of a most disagreeable appearance, so that we threw them into the fire without the slightest ceremony. They made up the entire contents of the kidney, which collapsed upon their removal like a crushed turtle's egg.

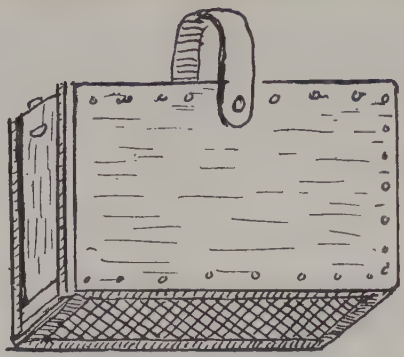
"These two Mink were taken at points within ten miles of each other."[55]

The editor adds: "The worms here described belong to the group known as *Nemathelminthes*, or round-worms, and occur as parasites in the kidneys of a number of carnivorous animals. It would be impossible to say definitely what these were without seeing them, but Prof. C. W. Stiles, on reading the description, says that it sounds suspiciously like young specimens of the Dog kidney-worm."

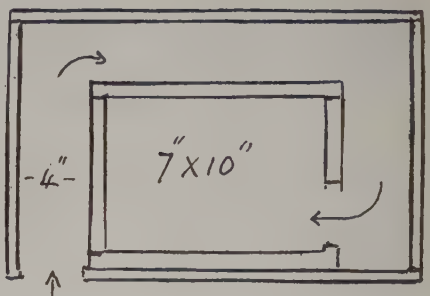
Napoleon A. Comeau, the well-known Quebec naturalist, of Godbout, comments on this as follows: "The observations and notes on this subject by W. M. H. in your issue of May 14th, are quite correct. I have observed this affection in Mink many times, but in all those I saw, there was only one worm. I recall one case where this worm was about 10 inches long, and looked very much like a round-worm (*Ascaris lumbricoides*). Strange to say, the animal does not appear to suffer from them, because I specially noticed that the animals were in good condition. Of the kidney, there was nothing left, except the outside membrane which was yellowish in colour. Before being cut open, it feels very hard to the touch."[56]

[55] Forest & Stream, May, 14, 1910, p. 770.

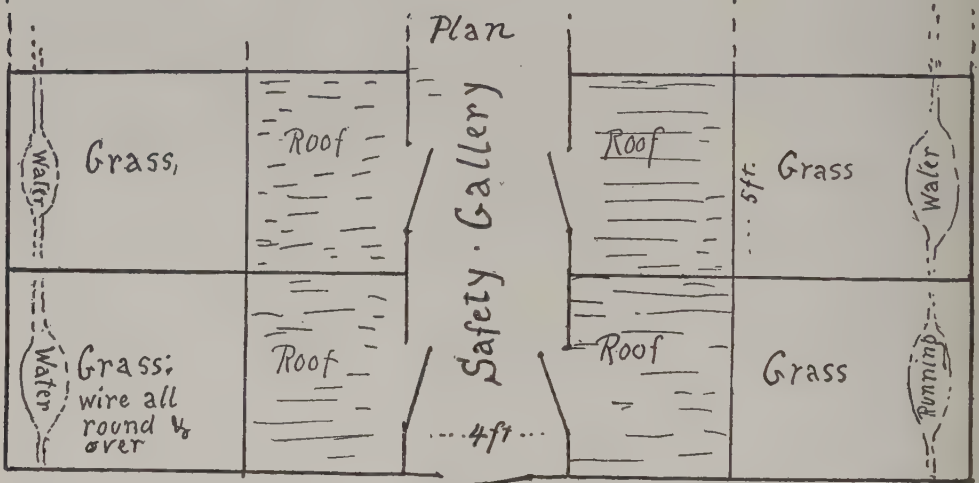
[56] Forest & Stream, June 11, 1910, p. 934.



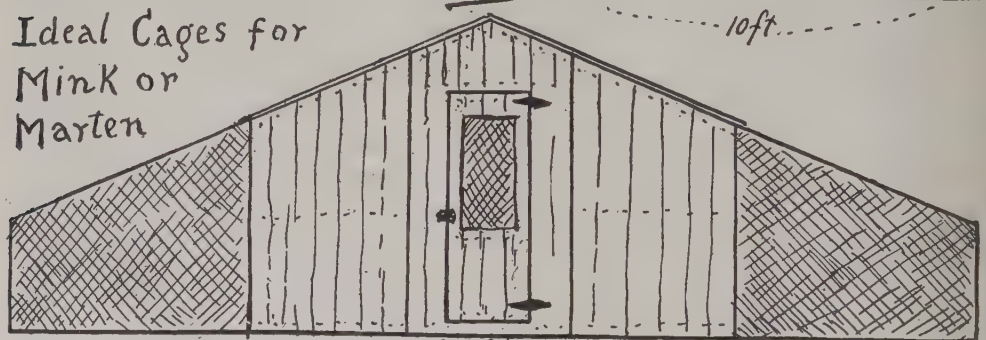
Examining box



Double den-(box)-plan



Ideal Cages for Mink or Marten



End Elevation

Plate LXXXVI. A Model Minkery

Tail-rot is a disease found in captive Minks, but not, so far as known, in wild ones. The fur rancher must also be prepared to combat mange, lice, and intestinal worms.

On Sept. 12, 1913, a female Mink in my menagerie was seized with convulsions and fits, exactly as described in the Marten Life. Next day, however, she was fully recovered. I have seen this several times.

In all, I have bought 25 Mink that were taken wild, most in box traps, but some in leg-traps, and not one of them survived a year in captivity. Every known expedient was tried, but each and all sulked and pined away.

As a cage animal, provided the box be not too large, the Mink's habits of sanitation are scrupulously correct, except in the matter of storing food in the sleeping den.

L. D. McClintock says: "In a state of captivity, some Minks have very dirty habits, especially if the den or nest box is more than about 10 inches or so square, inside measurement. With a large den, many Minks develop the habit of depositing their excrement in one corner. When, however, the den is small, they will usually go outside."

Not Sociable, but Highly Vocal

So far as known, the only exceptions to solitary life among Minks are during the mating season, and while the young are with the mother. As these are strictly family groups, they are not real exceptions, and the Mink must be considered an unsociable animal.

The Beaver, as will be fully set forth later, has invented a curious kind of mud-pie telephone for communication with its fellows. On one or more prominent points, it makes a little pudding of mud, which it seasons with a dash of the strange odorous castor that is produced in the creature's musk sacs. Each Beaver that comes along examines the fragrant mess, adds a gob of mud and a dash of his own sweet personality. Thus they have at least an idea of who was there lately, as well as a general idea of "Who's Who" in Beaverland.

In the Wolf Life, Vol. I, p. 286, is described a somewhat different mode of record, the urinary smelling post.

The Mink has adopted ideas from both apparently. At intervals throughout the Mink range will be found flat stones, projecting logs, or prominent bog-lumps, on which each Mink who passes, feels it a duty to drop dung, and—but of this I am not sure—urinate. The dung carries with it some of the anal gland secretion, and the result is a smell-telephone of crude construction, yet developed so that each Mink calling at this "letter

box" or "card tray", can tell who has been there lately; and, if a stranger, whether it was male or female, old or young, hale or helpless.

Further, the recent food of said previous visitor is more or less indicated, so that the Mink now calling knows just what kind of foodstuffs are found in this region.

The fact that we ourselves get this very information from the Mink's calling place, is evidence that the Mink also can do it, for their senses are keener than ours. This is a justification of the practice.

This rudimentary wireless appears to be the Mink's sole impersonal mode of intercommunication, and a very poor one at that.

Voice. The only sounds I have heard the species utter are a growl, a deep savage snarl, a louder snarl of defiance that is almost a scream, and finally a shrill screech when it is in a trap. And, oh, what a screech it is! Far-reaching, ear-piercing, and expressive in the last degree of animal fear and rage.

H. Preston, the trapper, says: "Did you ever hear a Mink scream? I well remember the first one I caught, it was 'way in under some roots. I poked him out and hit him, and what a hair-raising scream I heard; it sure made me feel creepy."[57]

Kennicott credits the Mink with uttering a remarkable shrill, twittering squeak, not unlike that of a bunting, but this only when hurt or excited.[58] To these we must add the loud sniffing, which, while it is merely an attempt to smell clearly, also conveys to another Mink the idea that "Here there is something worth while smelling. So, come, let's investigate."

The Character of the Mink

The Weasel is a sanguinary little incarnation of fury and valour, with but little cunning; it is low in intelligence, and incapable of friendship with man, or any one else. The Otter, though a Weasel in pedigree, seems to have responded to the elevating and gentling influences attendant on the Fisher-life. It is the least destructive, the most docile and intelligent of the Family. The Mink is halfway between, in habits and character, as it is in food and haunts. After sojourning in the reeds along the river for a time, catching fish and killing Muskrats in Otter fashion, or running down Rabbits and Mice in Weasel fashion, it may set out across country to find better hunting, and happen, in its travels, to discover the real Happy Hunting Ground in the form of some farmer's barnyard. Very naturally, it settles

[57] Hunter-Trader-Trapper, Nov., 1924, p. 67.

[58] Quads. Ill., p. 103.

down in this ideal spot—didn't it set out to find this very thing? This highly populated wilderness of buildings and sheltered nooks is perfect, and here "every prospect pleases—only man is vile."

The Mink's attitude toward this game preserve is quite different from that of the lesser Weasels. *They* are mad to kill—kill—kill; they will, if possible, kill everything there in one night, then leave the ruined place to seek some new field of carnage. Not so the Mink. It has but little of the killer spirit. It kills because it must eat, and, having found the well-stocked henneries, it says to itself, "Here now will I settle down, eat, drink, and make merry, for these are mine own preserves by right of discovery, and I will defend them against all invaders."

On the list of invaders it puts the farmer and his family, and his Dogs and his Cats, and all those that put their trust in him. From safe hiding under the barn or in the log-pile, it sallies forth at night to kill and eat; sometimes one fowl each night for many nights in succession; sometimes it yields to the blood lust (not unknown among mankind), and kills half-a-dozen of the defenceless prey, feasting only on those choicest parts of all, the blood and brains, just as the Buffalo killer would shoot down half-a-dozen Buffalo because it was so easily possible, and then take nothing but the tongues.

Usually the Mink is killed before leaving the barnyard precincts, but it often happens that a number of narrow escapes from shotguns or Dogs decide it to move on. In the hours of the night, it goes forth, bounding with high-arched back. Its speed is not great, but, like all Weasels, it is possessed of endless strength and doggedness, and though a man can outrun it in the open and outwalk it travelling, its steady bounding may take it miles away before morning.

As it journeys, it is ever on the alert for guidance from its nose. There are a thousand accidents to turn its steps one way or another; the cluck of a grouse, the rustle of a Mouse in the grass, an easier path, a promising odour in the wind, the wind itself, may each and all give trend to its tireless bounding, and bring the hunter at last to some marsh-land of promise, or mayhap another barnyard. Here it may settle down again to comfort of a kind, taking, undoubtedly, its life in its teeth while doing so—a condition that it has not the wit to think about; and if it had, it would simply dismiss the thought, viewing this merely as the normal condition of all existence. The Mink certainly never spent a moment of its life without being under the shadow of impending death, and, as certainly, it never lost a wink of sleep through thinking about it.

If surprised during its hunting, or suddenly brought face to face with

man, it often rises up on its hind quarters to get a better view; in this position it looks extraordinarily long. I once met one out on the prairie. It rose up to scan me from every one of its twenty-four inches of stature, and stood so, till I came within ten feet.

When cornered and at bay, it is the embodiment of savage ferocity. Doctor Coues has given us a masterly picture of a Mink in a trap. "One who has not taken a Mink in a steel trap, can scarcely form an idea of the terrible expression the animal's face assumes as the captor approaches. It has always struck me as the most nearly diabolic of anything in animal physiognomy. A sullen stare from the crouched motionless form, gives way to a new look of surprise and fear, accompanied with the most violent contortion of the body, with renewed champings of the iron, till breathless, with heaving flanks, and open mouth dribbling saliva, the animal settles again and watches with a look of concentrated hatred, mingled with impotent rage and frightful despair."[59]

This is the picture by a man who had seen it. He had eyes, but surely he lacked both ears and nose, else he had recorded the piercing screech of fear and fury, and the all-pervading, far-reaching, skunk-emulating, musky stench with which the trapped Mink never fails to saturate the air, the place, the trees, the breeze; and so proclaim afar and afterwards that hereabouts a Mink was held in direst straits.

His Kindliness

A tame Otter makes one of the most engaging of pets. No normal man ever made a pet of a Weasel, but tame Minks have often proved most docile and interesting little creatures, capable of forming strong attachments, although ever ready to bite when provoked.

Beginning with Samuel Hearne, we have an unbroken testimony of praise when considering it as a tame animal. He says:

"They are the easiest to tame and domesticate of any animal I know except a large species of Field-mice, called the Hair-tailed Mouse [Lemming]; for in a very short time they are so fond, that it is scarcely possible to keep them from climbing up one's legs and body, and they never feel themselves happier than when sitting on the shoulder; but when angry, or frightened (like the Skunk), they emit a very disagreeable smell. They sleep very much in the day, but prowl about and feed in the night; they are very fierce when at their meals, not suffering those to whom they are most attached to take it from them. I have kept several of them, but their overfondness made them troublesome, as they were always in the way; and their

[59] Fur-bearing, p. 176.

so frequently emitting a disagreeable smell rendered them quite disgusting."[60]

It is worthy of note, however, that young Skunks are never guilty of this impropriety.

Richardson, in his famous *Fauna Boreali Americana*, says: "It is easily tamed and is capable of strong attachment. In a domestic state, it is observed to sleep much in the day, and to be fond of warmth. One, which I saw in the possession of a Canadian woman, passed the day in her pocket, looking out occasionally when its attention was roused by any unusual noise. Like a Cat, a tame Vison is easily offended, and will, on a sudden provocation, bite those who are most kind to it. It is fond of being caressed."[61]

Next, John Bachman adds his own experience. He says: "The Mink, when taken young, becomes very gentle and forms a strong attachment to those who fondle it in a state of domestication. . . . We had in our possession a pet of this kind for 18 months; it regularly made a visit to an adjoining fish-pond both morning and evening, and returned to the house of its own accord, where it continued during the remainder of the day. It waged war against the Norway Rats which had their domicile in the dam that formed the fish-pond, and it caught the frogs which had taken possession of its banks. We did not perceive that it captured many fish, and it never attacked the poultry. It was on good terms with the Dogs and Cats, and molested no one unless its tail or foot was accidentally trod upon, when it invariably revenged itself by snapping at the foot of the offender.

"It was rather dull at midday, but very active and playful in the morning and evening and at night. It never emitted its disagreeable odour except when it had received a sudden and severe hurt. It was fond of squatting in the chimney-corner, and formed a particular attachment to an armchair in our study."[62]

H. Resseque, of the Minkery, says: "If taken in hand when their eyes are first open, they are readily tamed; they should not subsequently be allowed to remain with the mother or in each other's society. By continual petting and handling, they become like domestic ratters, and have all the playfulness of the young of the feline tribe. They may be handled without fear of their sharp teeth, but they prove extremely mischievous, their scent leading them to food not intended for them. Their fondness for bathing will prompt them to enter a tea-kettle or any open vessel, and when wetted,

[60] Journey, 1795, p. 377.

[61] F. B. A., I, 1829, p. 49.

[62] Q. N. A., I, pp. 258–59.

they will roll and dry themselves in a basket of clothes fresh from the laundry, or even upon a lady's dress, occasioning much inconvenience."[63]

The two young Minks that I sketched in the menagerie of W. F. White, of Winnipeg, in Aug., 1905, were half grown and as tame and gentle as kittens. They were allowed to run free, but went usually into their own cage to sleep. They were the most restless little things I ever saw, their noses were never done sniffing and poking, their little bodies were never still, except during the brief hours of sleep.

Merriam thus adds his testimony to the many who advocate the Mink as a ratter: "When taken sufficiently young, he is easily domesticated and makes one of the very best of ratters. He follows these common pests into their holes and destroys large numbers of them. The remainder are so terrified that they leave the premises in great haste and are not apt soon to return."[64]

The Mink and the Trap

Though more wary than Skunk or Weasel, the Mink is easily trapped. Some of the old ones that have had painful experiences, become cunning, but most of them are unsuspicious of danger in any inanimate form. They will enter the most obvious of traps, especially if they be baited with the head or blood and brains of some large bird—delicacies that have as strong an appeal to the Mink as catnip for a Cat, or honey for a Bear.

In the fall of 1886, I put out a steel trap for a Mink that used to travel up the old DeWinton Slough, back of Carberry. The trap was set, by luck, just the day before he passed that way, but, unfortunately, a ruffed grouse chanced to run through the thicket and get into the trap, so the Mink, coming on the scene, discovered a feast ready prepared for him. On returning next day, I found the remains of the grouse with other details of the affair, so reset the trap in the same place. Lutreola was lurking near; next night I caught him by the front foot, but he gnawed the foot off and escaped. I was prevented returning to the trap for several days. Then I found the same Mink caught in it by the hind leg. He had gnawed off the leg, *but beyond the trap*, and was still held by the stump. He was dead, and buried, too, for he had raked together all the leaves, grass, earth, and sticks within the length of the chain. Trap and all were hidden; only his head and his remaining front arm were out of his self-made funeral mound.

Manly Hardy tells us that the Mink, like the Otter, often bury their

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[63] Coues, Fur-bearing, p. 183.

[64] Mamm. Adir., p. 67.

PLATE LXXXIV.—THE MINK

PLATE LXXXVII.—THE MINK'S FEAST

comrades under leaves and moss, when found dead in a trap,[65] but in this case, it looked as if the victim had buried himself.

The old-fashioned deadfall is the trap that should be used, as it does not injure the fur, and it kills the animal instantly, so that there is no unnecessary suffering.

Manly Hardy writes: "I very much prefer log traps for Mink, Sable, and Fisher, unless Fisher have been made shy by escaping from too weak a trap. One can set log traps faster, and the animals do not suffer as in steel traps. Trapping, like war, is cruel at its best."[66]

The box trap is effectual and humane if visited regularly. It should have, at the back, a window covered with $\frac{3}{4}$-inch mesh wire netting. It has the advantage of protecting its catch from passing marauders. The steel trap, if used, should be visited often. The less the creatures suffer, the better the fur. In the unhappy case cited above, the pelt was worthless.

Strange Happenings

Emergencies are like a flash of lightning on a dark landscape. They suddenly and vividly reveal a score of tremendous features whose existence was not even suspected. Emergencies among the animals are apt to emphasize their kinship with man. Thus they are, indeed, character revelations.

From the pages of the perennial Bachman, I select the first of these. Describing the pursuit of the marsh-hen by the Mink, he says:

"It is at low tide that this animal usually captures the marsh-hen. We have often, at high spring tide, observed a dozen of those birds standing on a small field of floating sticks and matted grasses, gazing stupidly at a Mink seated not 5 feet from them. No attempt was made by the latter to capture the birds that were now within his reach. At first we supposed that he might have already been satiated with food, and was disposed to leave the tempting marsh-hens till his appetite called for more; but we were, after more mature reflection, inclined to think that the high spring tides which occur, exposing the whole marsh to view and leaving no place of concealment, frighten the Mink as well as the marsh-hen; and as misery sometimes makes us familiar with strange associates, so the Mink and the marsh-hen, like neighbour and brother, hold on to their little floating islands till the waters subside, when each again follows the instincts of nature."[67]

The next instance may have a similar explanation, but, judging from

[65] Forest & Stream, Mar. 11, 1911, p. 371.

[66] Forest & Stream, May 28, 1910, p. 850.

[67] Q. N. A., I, p. 256.

many precedents, is best explained by assuming a kindly and merciful streak in the Mink.

During my Mink-farming years, I bought a score or more of Mink at different times from Wallace Evans, the game-breeder at St. Charles, Ill. These were caught by his men, when they raided or tried to raid the pheasant coops. Most were taken in pitfalls, therefore quite uninjured.

The plan of shipping was well worked out, a box cage with two compartments, one wholly dark, filled with straw, and with a 3-inch entry from the other, which was half dark, and contained food, water, and a live Rat. Many Rats were taken at the same time, and in the same way as the Mink.

If the weather was warm, the 3-days' trip from St. Charles usually spoiled the meat. Then the Mink could amuse himself and get some fresh meat by killing the Rat. The plan worked well and many times.

On Nov. 30, 1913, the keeper came to me and said: "There's a live Rat in the cage with that Mink that arrived Nov. 15th." As the cage was perfectly Rat- as well as Mink-proof, this was a mystery. On investigation, I found the Rat not only in the cage, but living in the den with the Mink. A thorough consideration of all the evidence made this certain:

The live Rat had been put in as usual with the Mink, for food. But either the Mink was not hungry, or the Rat was wise and valiant, for, in some way, a friendship sprang up between the two, and they were sharing bed and board—for a period of 20 days now—when I lighted on the strange occurrence.

The keeper killed the Rat before I could stop him, so the story cannot be told wholly as it should be.

The last instance I shall give is from the journal of my boyhood:

On the 28th of June, 1883, as I prowled through the Sandhills, south of Carberry, Manitoba, I heard a faint mewing or squeaking. Following the sound, I was led to a thicket between two small lakes, and here, on the bare ground, in a sort of runway, was a baby Mink, fully haired, but blind and helpless. I took him home in my pocket. He was restless and rather whiny, with occasional outbursts of temper, unusual in one so young. I put him in my shirt sleeve, and he worked his way up to my shoulder, where I took him out. Once or twice he did this; then I showed off the trick to my friends. The little Mink crawled halfway up, then paused to drive his baby teeth into my arm. He did not draw blood, but now I knew he could not be trusted.

In the barn was an old Cat with a brood of small kittens. Knowing the vast, inclusive mother instinct of a Cat, I entrusted her with the hungry

little Mink. She received him kindly, and the foundling fell to feeding with the eagerness of long hunger.

An hour or so later, I heard some suppressed yowls from the Cat. Then again I heard squeals from the kittens. Investigation showed the Mink sleeping among his foster brothers.

Next day, I heard more squeals from the kittens and found the little Mink clenched on the ears of one, worrying with all the small strength of a blind baby fury.

On the 30th of June, his eyes opened, so I knew he must be about four weeks old.

More than once in the next few days, I heard yowls from the Cat, and saw other attacks by the Mink on the kittens. But believing that however good his intentions, he had not the strength to do any real harm, I did not interfere.

On July 7th, I heard an uproar in the barn among the hens. One hen was running around demented, and hanging to her was the small brown demon, doing his best to cut her throat.

The outcries of Cat and kittens had greatly increased the last few days. A neighbour who came to see my chickens, was being proudly shown the Cat that was fostering a Mink. As I lifted the Cat, the neighbour exclaimed: "Good heavens, see how he has her all ate!"

For the first time, I now examined the old Cat, and learned a horrid story of mother love and diabolic ingratitude. Each time, it seemed, that little fiend incarnate, after accepting the love and nursing of the good old Cat, had clinched on her body and tried to tear her with his teeth. Four of the teats were gone, torn off, with dreadful sores to mark the place of each. In one spot, the atrocious little beast had eaten a hole through her skin and tissues, till her bowels were exposed.

This was the reward of her mother love. And yet, day by day, she had submitted. Was ever there a more fearful trial of devotion?

Horror-stricken was I; and felt guilty for having made such a thing possible. I seized the little hell-hound and——!!

Two kittens we left with the old Cat for solace of her body and her heart. Slowly she was healed, though never recovered.

For years I have had this story in my journal of the time, and never dared to tell it till now. At that time I believed it was characteristic of the Mink, and so I dared not tell it. Now, with knowledge of many Minks and a better measure of their minds and ways, I know that I had unhappily fallen on an atrocity, a pervert, a moron, a criminal among the Minks; one

who, as like as not, would have served his own mother as he did the Cat, but would have been served by her in the end as I did him.

I wonder now if, when I first found him, his mother had not already cast him out as an impossible member of the family.

References for Mink

1849—Quadrupeds of North America, by Aubudon & Bachman, I.
1851—Arctic Searching Expedition, by Sir John Richardson, I.
1858—Quadrupeds of Illinois, by Robert Kennicott.
1877—Fur-bearing Animals, by Dr. E. Coues.
1884—Mammals of the Adirondacks, by C. Hart Merriam.

LIFE XXXV—THE SEA-MINK

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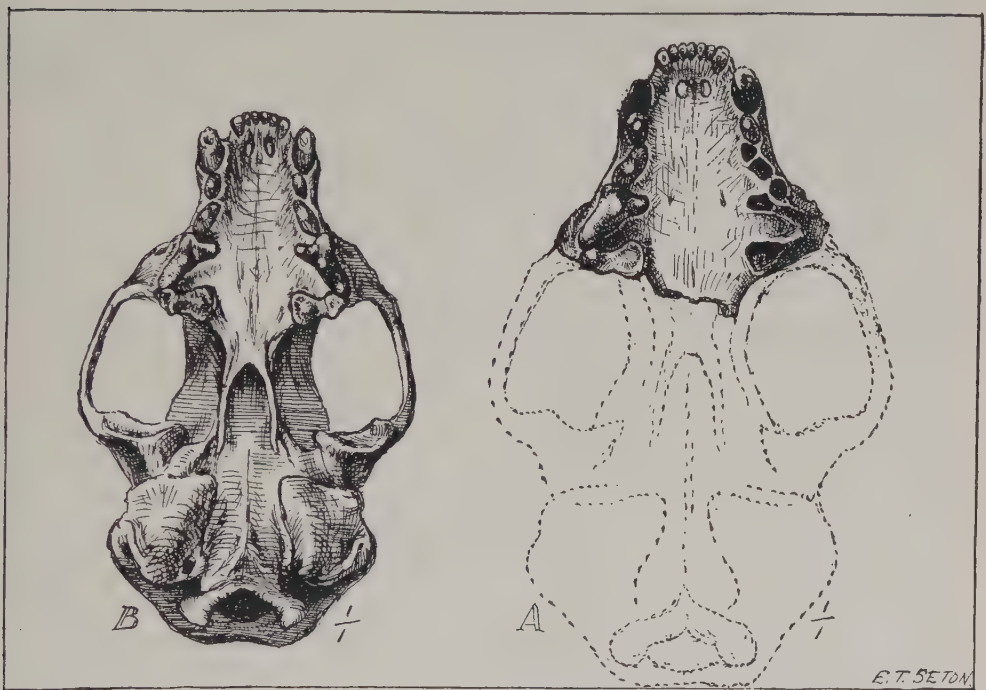


A. Sea-mink – from type Sp. No. 115178. U.S. Nat. Museum
B. Common Mink ♂; taken near Chicago. Seton Coll. 1406

The Sea-mink

Mustela macrodon (Prentiss)

(Gr. *macros*, big; *odon*, tooth)

Lutreola macrodon Prentiss, 1903, Proc. U. S. N. M., Vol. 26, p. 887.
Mustela macrodon Miller, 1912, N. A. Land Mamm., p. 101.

Type Locality—Shell heaps at Brooklin, Hancock Co., Maine.

Size. Larger than the largest of existing Minks. Probable dimensions: Total length, about 36 in. (914 mm.); tail, 10 in. (254 mm.); hind foot, $3\frac{1}{2}$ in. (88 mm.).

Colour. More reddish than the common Mink. Fur very coarse.

This seems to have been the species of Mink that was known in the Bay of Fundy as the Sea-mink or Big Mink, and which became extinct about 1860. All that is known concerning it is D. W. Prentiss's description of the fragmentary skull, and Manly Hardy's memory of it when it was common. The two articles contributed by these observers I reprint in detail.

"Upon the shores and islands of Penobscot Bay and the adjacent coast, there exist numerous shell-heaps, the majority of which were made by the Indians. They vary greatly in size, some being an acre in extent, while others cover but a few square yards. The age of the majority of these shell-heaps is unknown, but from the absence of metals and articles of European manufacture from many of them, it is allowable to suppose that these at least date back to pre-Columbian times. This idea is strengthened by the discovery in one of them of the fragment of the skull of a Mink, representing an extinct species which appears to be new, and is below described for the first time. Remains of other extinct species of animals will doubtless be detected as our knowledge of the contents of these shell-heaps increases. The drawings illustrate well the specific differences pointed out below.

. . . . . .

"The measurements of *L. macrodon*, compared with those of *L. v. lutreocephalus*, its nearest relative, show the enormous size of this Mink. *L. v. ingens* was until now the largest American Mink, but it is decidedly smaller than the one here described.

"The resemblance of this species to *L. v. lutreocephalus* is very striking, but the difference in size of teeth, the angle of the nasals, and the position of the carnassials, justify me, I believe, in the absence of intermediate forms, in describing it as a new species."[1]

Manly Hardy was the well-known hunter-naturalist of Brewer, Maine. The publication of Prentiss's paper evoked the following information from Hardy. It appeared in *Forest & Stream* for Aug. 15, 1903, p. 125.

"The Extinct Mink from the Maine Shell-heaps

"Some 75 years ago, and for many years thereafter, my father, who was a fur-buyer, used to have nearly all the furs taken on the islands of Penobscot Bay, from the mouth of the Penobscot, eastward to Frenchman's Bay. Many of the Mink, especially from Swan's Island and Marshall's Island, were fully twice as large as the Mink from inland, the smallest of them being as large as the largest inland Mink, and the largest fully twice the size of their inland relatives. I remember hearing them frequently spoken of as being 'as large as small Cats.' Later, I saw and handled many of these Mink. Their fur was much coarser, and was of a more reddish colour than that of the inland, or, as they were then called, 'the Woods Mink,' to distinguish them from the Sea-mink. These Sea-mink were usually extremely fat, and the skins had an entirely different smell from that of the Woods Mink. I could, with my eyes shut, pick them out from the Woods Mink by their peculiar smell.

"In the old days, when Mink were judged by size instead of by fineness and colour, as was done later, these Sea-mink used to bring considerably more than others on account of their great size. On this account, they were persistently hunted. Yet scarcely any were trapped on the islands. Instead, they were shot or hunted with Dogs trained for the purpose. As the price of Mink rose, they were hunted and grew scarce, till in the '60's, when Mink skins brought 8 or 10 dollars apiece, parties who made a business of hunting, nearly or quite exterminated the race. Some of these men went from island to island, hunting any small ledge where a Mink could live. They carried their Dogs with them, and, besides guns, shovels, pickaxes, and crowbars, took a good supply of pepper and brimstone. If they took refuge in holes or cracks of the ledges, they were usually dislodged by working with shovels and crowbars, and the Dogs caught them when they came out. If they were in the crevices of the rocks where they could not be got at, and their eyes could be seen to shine, they were shot and pulled out by means of an iron rod with a screw at the end. If they could not be seen,

[1]Extinct Mink, Prentiss, as above.

they were usually driven out by firing in charges of pepper. If this failed, then they were smoked with brimstone, in which case, they either came out or were suffocated in their holes. Thus, in a short time, they were nearly or quite exterminated.

"My opinion is that the so-called new Mink is nothing more or less than the skull of one of these large Sea-mink. I think so because, having handled at a very low estimate at least 50,000 Mink skins taken in Maine and the Provinces, besides skins from most of the States and Territories, I have never seen any as large as those Mink used to be. I have handled very large Mink from Minnesota, the Red River of the North, and Fraser's River, but some of the Sea-mink were larger than any of these.

. . . . . .

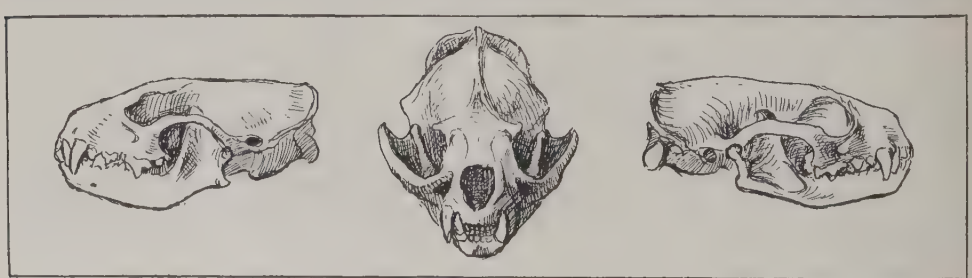
"The Mink which are now taken on our sea-coast along Penobscot Bay, are quite large, and the fur is coarse, but we get none of the great Sea-mink like those taken 40 or more years ago."

In 1921, I sent the following to the *Journal of Mammalogy*. It appeared in the issue for August, p. 168.

"There are traditions along the coasts of Maine, New Brunswick, etc., of a gigantic Mink known as the Sea-mink, which was commonly trapped there during the early part of the 19th century. It disappeared about 1860.

"It is probable that this was the *macrodon* of Prentiss, 1903. If so, it is likely that specimens were preserved. It was the custom in the small hotels of the above region, to have mounted any local animal of unusual interest in point of size, etc. These rarities were kept in glass cases as parlour ornaments or as barroom accessories. If some of our travellers, this summer, would keep a lookout for monstrous Mink in glass cases, and also inquire among the old-timers for information about the Sea-mink, we might get interesting details or even specimens.

"At this very day, there must be at least 100 men living, who in their young days, hunted the Sea-mink. Cannot some of our travellers find them in the Bay of Fundy region and learn the full story of this interesting species?"



LIFE XXXVI—BLACKFOOTED FERRET

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Blackfooted Ferret, Blackfoot Weasel, American Ferret, Prairie-dog Ferret, Prairie-dog Hunter, Yellow Polecat, Blackfoot

Mustela nigripes (Audubon and Bachman)

(L. *Mustela*, a Weasel; L. *niger*, black; L. *pes*, a foot)

Putorius nigripes Audubon and Bachman, 1851, N. A., II, p. 297.
Mustela nigripes Miller, 1912, N. A. Land Mamm., p. 102.

Type Locality—Fort Laramie, Wyo.

This remarkable animal is in a class by itself; that is, it has no very close kin in America. But it has a cousin of like complexion and make-up, in the person of the South Siberian Ferret (*Mustela eversmanni*). No doubt its remote ancestor came over from Asia. This lone wanderer seems to have been the adventurer of the family, the one who went far a-hunting; and finding the land of the Prairie-dog a well-stocked game preserve much to his taste, settled down like Mayne Reid's "Desert Hunter," to live his life, and forget his home-folk far away.

At a fleeting glimpse, when alive on its native plains, the Blackfooted Ferret looks like a yellow Mink, with black feet and tail, and a black domino across its eyes.

With the generic characters, it combines the following:

Size. Total length, 23 in. (580 mm.); tail, $5\frac{1}{4}$ in. (130 mm.); hind foot, $2\frac{3}{8}$ in. (60 mm.).

Colour. General colour, pale yellowish buffy, becoming nearly white on the face, throat, and lower parts of body and tail; tinged on the top of the head, middle of back with brown; a black mask across the eyes; the feet and the last third of the tail, blackish brown.

Sexes alike, but the ♀'s about 10 per cent. less in size.

History

This interesting little beast had a book history somewhat like that of the White Goat. That is, it was described on the strength of one defective skin, long ago (1851); accepted, then lost sight of for so many years that some good naturalists, J. E. Gray, for instance, entertained serious doubts

of its existence. Since then, it has been rediscovered once or twice; and though considered rare, is now fairly represented in the best museums.

Numbers

Audubon, the far-travelled, and Bachman, the lynx-eyed, saw the skin of this animal once, but never met the living creature at all. When Coues wrote his "Fur-bearers" in 1877, 5 or maybe 6 fragmentary skins were all he could discover. When Merriam wrote his "Synopsis of the Weasels of N. A." in 1896, he had less than half-a-dozen good specimens to work with—all that had been accumulated since 1851.

Merritt Cary writes in Bailey's "Texas," p. 198, as follows: "A number of Blackfooted Ferrets are said to have been caught at the dog-town south of the Stanton stock yard [Texas] in past years; and every person questioned was familiar with the animal and could give a good description of it." This, however, is all hearsay.

J. A. Loring found an almost perfect skull of a fine adult Ferret at Childress, Texas, on the house of a Woodrat; that is, in the collection of a Pack-rat. What delightful perspicacity! Real collectorship on the part of the Rat!

To sum up, Bailey, in "Texas," cites 4 doubtful records for the species, 5 hearsay records, 1 old skull picked up, but not one good specimen. Warren, in Colorado, lists 2 hearsay records, 3 specimens; Cary, in Colorado, 6 hearsay records, no new specimen. In the American Museum of Natural History are 5 examples—1 a useless Zoo skin, 3 good specimens. In the Field Museum, there are no specimens. In the Colorado Museum at Denver, there are 6 specimens, 3 of them mounted. In the U. S. National Museum, there are 18 good specimens.

This parsimonious raking together of scraps of skins, broken skulls, and doubtful records, all tells the same tale—that the species is exceedingly rare, is probably on the wane.

Range and Haunts

The range of the Blackfoot is said to be the Great Plains, from western North Dakota and northern Montana to Texas. Its range coincides nearly —maybe exactly—with that of the Prairie-dogs. On the map, I have put a black spot for every definite record of the Blackfooted Ferret, taking them from the authorities listed for reference with this Life, from personal observations, and, especially, from the records of the Biological Survey. The Calgary spot is from D. G. Elliot's Catal. Mamm. Field Mus., 1907, p.

448. Not one of these records is outside the Prairie-dog country; and there is little doubt that in time, the whole of said country will be blackspotted for the Ferret, unless we succeed in exterminating both species before sufficient notes can be made.

Although essentially a creature of the plains where dwell its favourite foods, the following records are exceptions to be noted:

"In Colorado, it is found on the plains east of the mountains, and has also been taken west of the Pike's Peak Range, at Divide, Teller County, 9,200 feet elevation. One was also found dead in Lake Moraine, El Paso County, 10,250 feet elevation; but it is not known how it came to be there. The lake is surrounded by hills and mountains, with much timber. Divide, however, is open country, with Prairie-dog towns all about. The animal has also been reported from the South Park. A. H. Felger has recorded, in University of Colorado Studies, Vol. VII, two mounted specimens in the collection of R. S. Ball, Meeker, and which were taken within a mile of that place. This is the first definite record I have from west of the Continental Divide in Colorado. Mr. Felger has kindly given me advance information as to this. The University of Colorado has in its collection, one taken on the Laramie River, twelve miles south of the Wyoming line."[1]

"In the spring of 1904, C. E. Aiken mounted one which came from near Clyde Station, El Paso Co., altitude 9,440 feet."[2]

While these mountain records take the Blackfoot out of the range of the Common or Plains Prairie-dog, they are right in the midst of the country possessed by the two mountain species.

The only free, living specimen I ever saw, was on Roosevelt's old ranch on the Little Missouri, North Dakota, in September, 1897. This, like every one so far recorded—and they have been but few and far between—was in its natural surroundings, a Prairie-dog town, a robber baron securely established in the village of his helpless peasantry, which indeed he considers his lawful prey by virtue of his divine right and his equally celestial left.

Breeding

Very little is known about the breeding of this Ferret. There is no reason to suppose the creature widely different in this from other Weasels.

The den is almost certainly underground, probably in the abandoned home of a Prairie-dog whose family furnished him with a celebration feast on the day when he took possession.

[1] Warren, Mamm. Colo., p. 194.

[2] Warren, Mamm. Colo., 1906 edition, p. 264.

One man told Warren[3] that he had once seen 9 Blackfoots together. He does not say at what season; but this was probably the mother and 8 young travelling together to see the world, and learn some specialties by way of a post-graduate finish, as is the habit of all Weasels. Therefore, it would have been late in summer.

Any young naturalist who reads this demonstration of our ignorance, and happens to live on the Great Plains, should realize that here is a good opportunity to discover and contribute some valuable facts.

Habits

Very little is on record concerning the habits of the Blackfoot. We know that it lives as a parasite in the dog-towns, lives like a Mouse in a cheese, for the hapless Prairie-dogs are its favourite food, and its den is one originally made by the Prairie-dog for himself. Now and then, one is seen gliding about in the Prairie-dog towns, sitting up high for a moment, thus making a conning tower of its own long length, and passing in and out of the burrows at all hours of the day. Thus it is partly diurnal, though probably mainly nocturnal; for captive Ferrets always show extreme restlessness and activity at night. In which, indeed, they are like all Weasels.

In Kansas, its presence in certain localities appears to have been effective in exterminating Prairie-dogs; or at least in making the whole Prairie-dog population move out of a region over which hung the visible shadow of death, day and night. It has been suggested that this Ferret activity may account for the deserted dog-towns which are not infrequently observed on the Plains. It must be remembered, also, that Prairie-dogs exhaust their own food in a region, and then perforce move to fresh pastures not too far away.

The following paragraph by A. D. McCandless was received after the above was written, and is important confirmation. He was riding in the Sandhill country of Grant Co., northwestern Nebraska, in the June of 1908, and among his natural history observations writes as follows:

"In many places, I found the Prairie-dog being exterminated by a new enemy. It is described very much as one would describe a Mink, only somewhat larger and much like a Ferret, yet it is neither. Many old settlers, who have trapped for years and should know what it is, say that it is something new. A pair of them will start in at the end of a dog-town containing hundreds of Dogs; and in a year not a Dog will be left. I saw several of these deserted towns, but did not get a glimpse of the strange animal.

[3]Mamm. Colo., 1910, p. 195.

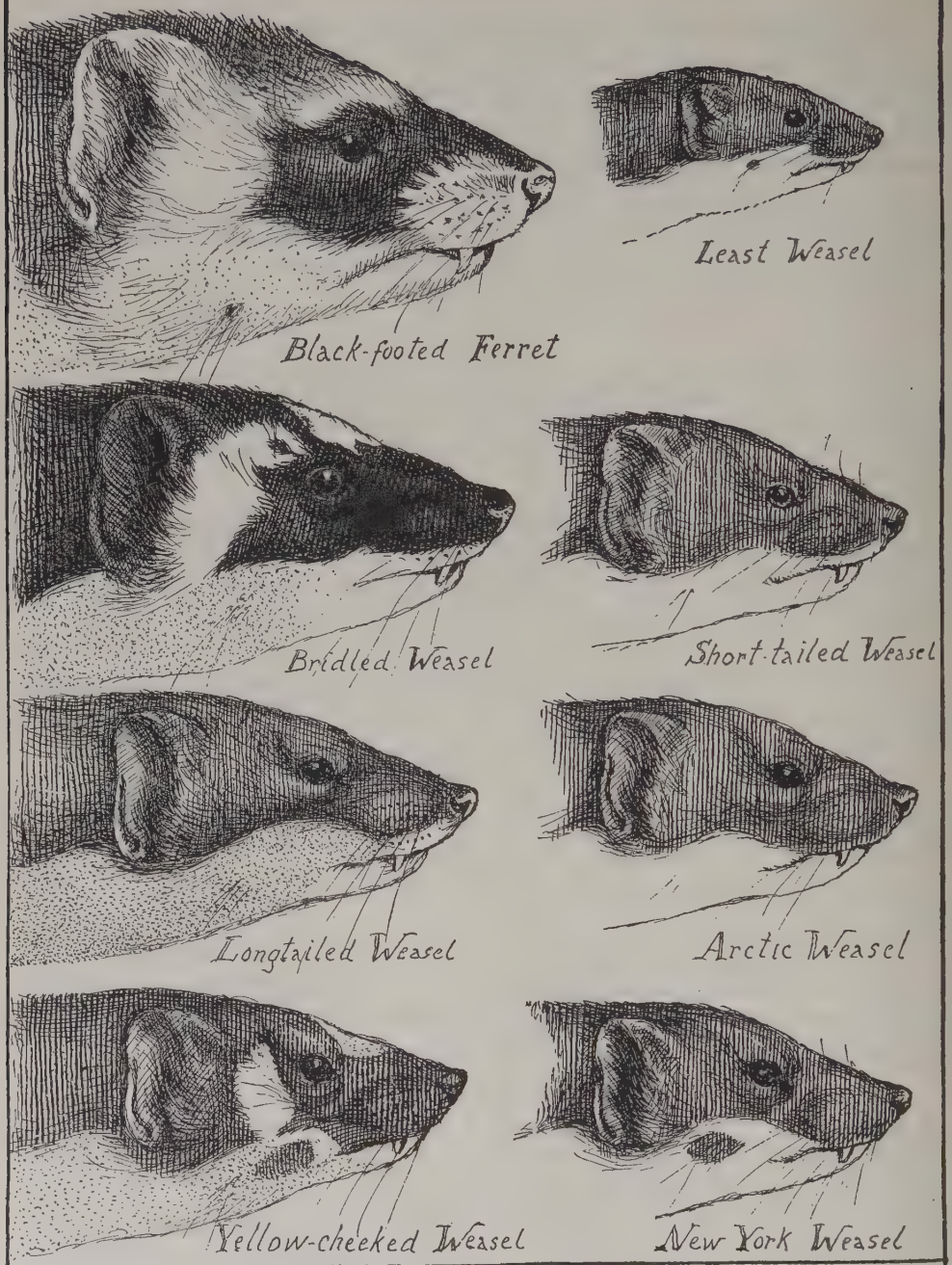

Plate LXXXVIII Weasel heads: all life size.
Summer coats E.T.S.

One old resident caught one of the new visitors in a trap and examined it closely, but could not name it, and turned it loose."[4]

Food

Though Prairie-dogs are to the Ferret what venison is to the Northern Wolf—his staff of life, his peculiar and special food—there is little doubt that he also kills Rabbits, Rats, Mice, and other rodents, in addition to taking whatever birds and birds' eggs may be secured. Not many, probably, are these last, for the Prairie-dog himself is keen for such dainties, and keeps the homeland cleaned up. If he is like the other Weasels—and no one questions this—the Ferret will add to the above list reptiles, insects, and fruit.

Nelson relates an instance that should firmly establish the Ferret in our good graces. One of this species, he says, lived for several days under a wooden sidewalk in the border town of Hays, Kansas, while indulging in the meritorious pursuit of killing the Rats which also harboured there.[5]

Roosevelt refers to it as "that rather rare weasel-like animal, which plays the same part on the Plains that the Mink does by the edges of all our streams and brooks; and the tree-loving Sable in the cold northern forests. . . .

"It is as bloodthirsty as the Mink itself, and its life is one long ramble for prey—Gophers, Prairie-dogs, Sage-rabbits, Jack-rabbits, snakes, and every kind of ground-bird furnishing its food. I have known one to fairly depopulate a Prairie-dog town, it being the arch foe of these little rodents, because of its insatiable blood-lust, and its capacity to follow them into their burrows. Once I found the bloody body and broken eggs of a poor prairie-hen which a Ferret had evidently surprised on her nest.

"Another time, one of my men was eyewitness to a more remarkable instance of the little animal's ferocity. He was riding the range, and being attracted by a slight commotion in a clump of grass, he turned his Horse thither to look, and to his astonishment found an Antelope fawn at the last gasp, but still feebly struggling in the grasp of a Ferret, which had throttled it, and was sucking its blood with hideous greediness. He avenged the murdered innocent by a dexterous blow with the knotted end of his lariat."[6]

It is natural to suppose that it may occasionally take poultry, if a chance to take poultry do come. Yet no one so far has charged it with this, the crime of crimes, the *lèse-majesté* of the feral world. And since the

[4] Forest & Stream, Aug. 29, 1908, p. 329.

[5] W. A. N. A., p. 571.

[6] Wilderness Hunter, 1893, p. 70.

Prairie-dog which it extirpates is formally listed as an "enemy alien," the Ferret must be listed as a farmer's friend.

What it does for drink, we do not know.

Disposition and Amusements

It has the same bold, inquisitive character shown by the other big Weasels; and when its interest is excited, will stand up on its hind legs, craning its long neck this way and that, high and low, in an effort to see, smell, gauge, and fully appraise the new object. When surprised in a dog-town, it commonly retreats to a burrow, but promptly turns and raises its head high out of the hole to observe the visitor, affording an easy shot; which is one reason why this scarce animal is becoming scarcer.

A very large, handsome male which I saw many times at the Bronx Zoo was the most uncompromisingly savage animal I ever met in America. The only creature I know that could compare with it is the European Wild-cat, notorious for its reckless, furious, unalterable ferocity.

However, this was captured after fully grown. Those who have taken them when young report that they readily respond to kind treatment, and, like the Mink, the Marten, the Otter, and some others that are desperate irreconcilables if captured too late, are among the safest and kindest of pets if taken before the formative period of character is over.

In the early '70's Mrs. M. A. Maxwell, the well-known hunter-naturalist of Denver, had several specimens of this animal in her collection. At that time it seemed to be not at all rare in some portions of Colorado. She secured one alive by drowning it out of a Prairie-dog hole. It was kept in confinement for some time. "It became quite tame, readily submitting to be handled, though it was furious when first caught. It was kept in a wire cage and fed on beef. When irritated, it hissed and spat like an angry Cat. It used to hide by covering itself over with the material of which its nest was composed; but at times, especially at night, it was very active and restless."[7]

Its mating habits, call notes, love notes, song, and amusements are wholly unknown. Nevertheless, it doubtless has amusements, as do most of its family.

On the pampas of South America are the towns of the Vizcacha, a prairie rodent that lives much like our Prairie-dog. Parasitic on it is a large Weasel, the Galictis. It is a near kinsman of the Blackfooted Ferret, lives the same life, and has probably the same pleasures. Therefore, as

[7] On the Plains and Among the Peaks, by Mary Dartt, 1879, p. 220.

sidelight, I quote the following account of a social affair in the Galictis world. It is from the pen of W. H. Hudson. In his chapter on "Music and Dancing in Nature," he says: "Wnile out tinamou shooting one day in autumn, near my own home in La Plata, I spied a troop of about a dozen Weasels racing madly about over a Vizcacha village—the mound and group of pit-like burrows inhabited by a community of Vizcachas. These Weasels were of the large common species, *Galictis barbara*, about the size of a Cat; and were engaged in a pastime resembling a complicated dance, and so absorbed were they on that occasion that they took no notice of me when I walked up to within 9 or 10 yards of them, and stood still to watch the performance. They were all swiftly racing about, and leaping over the pits, always doubling quickly back when the limit of the mound was reached; and although apparently carried away with excitement, and crossing each other's tracks at all angles, and this so rapidly and with so many changes of direction that I became confused when trying to keep any one animal in view, they never collided or even came near enough to touch one another.

"The whole performance resembled, on a greatly magnified scale, and without its beautiful smoothness and lightning swiftness, the fantastic dance of small black water-beetles, frequently seen on the surface of a pool or stream, during which the insects glide about in a limited area, with such celerity as to appear like black curving lines traced by flying invisible pens; and as the lines everywhere cross and intersect, they form an intricate pattern on the surface. After watching the Weasel dance for some minutes, I stepped up to the mound, whereupon the animals became alarmed, and rushed pell-mell into the burrows; but only to reappear in a few seconds, thrusting up their long ebony-black necks and flat gray-capped heads, snarling and chattering at me, glaring with fierce, beady eyes.[8]"

The End

When one finds an animal rare in spite of an ample range and abundant food, it commonly means that, for some unknown reason, that creature is dying out; Nature has set on it the mark of the death-house. The why-of-it is beyond our present limited knowledge, but some day we shall learn and profit by the truth. The Blackfoot, always rare, is becoming rarer. Now that the big Demon of Commerce has declared war on the Prairie-dog, that merry little simpleton of the Plains must go. In a few short years the tiny crater that erupted his annual families will be made no more, the older craters will be abandoned and crumble down to the level of the plain. And with the passing of the Prairie-dog, the Ferret, too, will pass.

[8]Naturalist in La Plata, 1895, pp. 385–86.

Is this a pleasant thought or a sad one? Does it inspire you to some action? If so, what? There is but a little time left in which to do it.

References for Blackfooted Ferret

1896—Synopsis of the Weasels of North America, by C. Hart Merriam, N. A. F., 11.
1905—Biological Survey of Texas, by Vernon Bailey, N. A. F., 25.
1906—Mammals of Colorado, by E. R. Warren, Colo. College Pub., XI, pp. 225–74.
1910—Mammals of Colorado, by E. R. Warren, New York, 300 pp. many ills.
1918—Wild Animals of North America, by E. W. Nelson.

LIFE XXXVII—THE BRIDLED WEASEL

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The Bridled Weasel

Mustela frenata Lichtenstein

(L. *frenata*, bridled, from *frenum*, a bridle)

Mustela frenata Lichtenstein, 1831. Darstellung Neuer oder Wenig Bekannter Säugthiere, pl. 42.

Type Locality—Valley of Mexico, near City of Mexico, Mex.

When seen alive, it strikes one as a large brown Weasel, with black head, on which are some curious white markings; and with an amazing length of tail.

A ♂ from Brownsville, Texas (A. M. N. H., No. 3832), is:

Size. Total length, 20½ in. (517 mm.); tail, 8¾ in. (222 mm.); hind foot, 2 in. (50 mm.) on dry skin.

Colour. All above, including tail, of a deep rich Weasel brown. All the underpart of the body, and insides of the legs, rich yellow buff, which becomes white on the throat and chin, and on top of the fore paws. The top of the head, the ears, and face, a deep rich, blackish brown, with the remarkable face marks as indicated in the sketch. The last inch of the amazingly long tail is black. (A typical ♀ from Jalisco, Mex., is much smaller and darker, and has the black of the head carried back nearly to the shoulders.)

The ♀ is similar to the ♂, but 10 or 15 per cent. less in size.

Races

The following forms have been recognized:

frenata Lichtenstein, the typical form. T. l., Valley of Mexico, near City of Mexico, Mex.

goldmani Merriam, like *frenata*, but with longer tail and feet, and all dark markings increased and intensified. T. l., Pinabete, Chiapas, Mex.

leucoparia Merriam, like *frenata*, but slightly larger, the black of the head reaching back down the neck; white marks on face, much extended. T. l., Patzcuaro, Michoacan, Mex.

neomexicana Barber and Cockerell, like *frenata*, but paler; white areas on head enlarged. T. l., Armstrong's Lake, Mesilla Valley, Donna Ana Co., N. M.

Range, Etc.

This Mexican species is included in the United States list on the strength of a very slight leakage into New Mexico and into the low country of southern Texas, where, however, it is far from common. Bailey records it[1] from Brownsville, near Hidalgo, San Diego, Beeville, Port Lavaca, Corpus Christi, San Antonio, El Paso, all in Texas; also at Mesilla Valley, New Mexico. All of these records are spotted on the map.

In its habits, so far as known, it resembles the other Weasels of its size.

Nelson supplies the following: "Once when hunting on the open plain near the southern end of the Mexican table-land, I saw at some distance what appeared to be a brown ball rolling about on the ground. This was soon determined to be a Weasel fastened to one of the large and powerful Pocket-gophers of that region. The Weasel had its teeth set in the back of the neck of the Gopher, while the latter was blindly trying to tear itself loose. I fired an ineffectual shot at the Weasel, and it vanished like a flash in the open tunnel of the Gopher. As I drew near, the Gopher, still in fighting mood, faced me with bared teeth. Later, when I removed its skin, I found that the Weasel had torn loose the attachment of the heavy neck muscles to the back of the skull, until only a thin layer remained to protect the spinal column. This had been accomplished without breaking the thin, but extremely tough, skin of the Gopher."[2]

References for Bridled Weasel

1896—Synopsis of the Weasels of North America, by C. Hart Merriam, N. A. F., 11.
1905—Biological Survey of Texas, by Vernon Bailey, N. A. F., 25.
1918—Wild Animals of North America, by E. W. Nelson.

[1] Texas, p. 198.

[2] W. A. N. A., p. 573.

LIFE XXXVIII—SHORT-TAILED WEASEL

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FOOD-TIME

Common Weasel, Short-tailed Weasel or Ermine of the Woods, Bonaparte Weasel, Brown Weasel

Mustela cicognanii Bonaparte

(L. *Mustela*, a Weasel; *cicognanii*, named in honour of Felice Cicognani, an Italian)

Mustela cicognanii Bonaparte, 1838, Charlesworth, Mag. Nat. Hist., Vol. 2, p. 37.

Type Locality—Northeastern North America.

French Canadian, *l'Hermine; le Roselet; la Belette de Bonaparte.*
Cree, Sauteaux, and Ojibway, *Shing-gwus'.*
Chipewyan, *Tel-ky'-lay.*
Yankton Sioux, *He-tong-ka-ska.*
Ogallala Sioux, *He-tu-kah'-san.*

The genus *Mustela* (Linnæus, 1758), comprises small snake-like quadrupeds with long necks and bodies, and short legs and ears; tail varies; 5 toes on each foot; usually of solid dark colour above, and solid light colour below. Teeth as follows:

$$\text{Inc. } \frac{3-3}{3-3}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{3-3}{3-3}\text{; mol. } \frac{1-1}{2-2} = 34$$

This is the Common Weasel about barnyards near the woods in all the Canadian Northwest. This is the American representative of the European Weasel. At a short distance, in summer coat, it looks like a brown Squirrel with white throat and paws, and a very small tail; it is mostly seen on the ground.

In addition to the generic characters, it has the following:

Size.—Length, 12 in. (305 mm.); tail, 4 in., (102 mm.); hind foot, $1\frac{1}{2}$ in. (38 mm.).

The ♀ may be one fifth or even one fourth smaller.

Colour. General colour above, dark brown; tip third of tail black; no dark spot behind corners of mouth; under parts, including upper lip, chin, throat, and front feet, white, sometimes tinged with yellow; hind feet, pale brownish-white.

In winter it becomes the Ermine. It is then pure white with a yellowish tinge on rump, tail, and under parts; the black tail-tip continues unchanged.

The Change to White Coat

The quick, almost sudden and very complete change of this, the Brown Weasel of summer, into the white Ermine of winter, is one of the most remarkable things about this animal. The creature becomes snowy white excepting the tail-tip, which continues unchanged, of a jet black; and sometimes there is a golden yellow tinge around the head and tail. This tinge is believed to be partly, at least, external staining from the smell glands with which the creature is so generously outfitted; that on the head being the result of sleeping with the head tucked under the tail.

The change in the Ermine is effected by a moult, and in Manitoba, occurs about the middle of October each year, without reference to the weather or the presence of snow; so that it is no uncommon thing to see a Weasel of dazzling whiteness running over the brown prairie or in the woods, still carpeted with dead leaves.

R. Lydekker says: "Modern researches have shown that the senile whitening of the human hair, and probably also the winter whitening of many Arctic animals, is due to the work of phagocytes."[1]

Apparently it is made in a few days; some have said it was achieved overnight. It seems, indeed, very sudden, but an explanation of this has been offered by George Shiras 3rd.

Shiras tells me that in November, 1907, about his camp in Newfoundland, they fed the Weasels that hung about. All (6 or 7) were brown. Then came the snow; and next day, all (still half-a-dozen) were white. In his opinion, however, this meant, not that they changed over night, but that the white ones already changed, had been hiding till the snow came, and the brown ones now had to hide till their change was complete; that is, 3 or 4 days.

The white coat, of course, enables the animal to live and hunt in the snow without being visible to all the creatures it would prey on or that would prey on it. It is strictly a protective plan of colouration. We are not surprised, therefore, to find that in countries where there is no snow the Weasels do *not* turn white.

Thus Allan Brooks says: "East of the Cascade Mountains, it always turns white in winter, but west of that range in southern British Columbia, it rarely undergoes a seasonal change."[2]

[1] Game Animals of Africa, London, 1908, p. 207.

[2] Recreation, Aug., 1899, p. 68.

So also the New York Weasel. Although an Ermine, or white winter Weasel, in most of its range, in Central Connecticut, according to Bangs, it never changes.[3] This ready adaptation to circumstances is one of those satisfactory affairs that are much more easily applauded than explained.

In Manitoba, as late as mid-April, I have found them in full winter pelage, at which time there may be not a trace of winter snows. Soon after this, they appear in the brown and white of the summer coat.

This, however, I think is a rule: While white Weasels may appear when there is no snow on the ground, no one ever saw a brown Weasel running on the snow.

Manly Hardy, the hunter-naturalist of Maine, offers some observations which are full of suggestive value, whether we accept his conclusion or not. In discussing the Mink's fur, he says:

"The new coat begins to grow, and by the first part of November or earlier, the pelt is clear white, and the fur fully grown"; then adds:

"It is the same with the Weasel. Before the colour begins to change, the new coat is fully grown, and this new coat gradually turns from brown to malty, and from that to white. I have had Weasels get into my traps at all stages of the change, and I know positively that they were not shedding. It is a singular thing that, although we had traps set on 6 different townships (a Maine township is 6 miles square), we did not catch a single Weasel, nor see the track of one after the snow came."[4]

Audubon records some observations on the springtime change of colour in a captive New York Weasel, as supplied to him by Ogden Hammond in 1842:

On March 6th, an otherwise white Weasel had a silky black coat of fur appearing on its nose, and in spots along the back. Daily observations showed that the white coat was being rapidly moulted, beginning on head and back; and by March 28th, the change to the new dark summer coat was practically complete.[5]

Races

The following forms of Short-tailed Weasel have been recognized:

cicognanii Bonaparte, the typical form. T. l., Northeastern North America.

richardsoni Bonaparte, like *cicognanii*, but larger; tail short, with terminal third black. T. l., Fort Franklin, Great Bear Lake, Canada.

[3] Weasels of E. N. A., 1896, p. 14.

[4] Forest & Stream, May 28, 1910, p. 850.

[5] Q. N. A., II, pp. 63–64.

mortigena Bangs, larger than *cicognanii* and lighter coloured. T. l., Bay St. George, Newfoundland.

alascensis Merriam, much like *richardsoni*, but white tips on the feet more extensive. T. l., Juneau, Alaska.

microtis Allen, like *richardsoni*, but very much smaller, with very small ears. T. l., Shesley, B. C.

streatori Merriam, like *cicognanii*, but smaller and darker. T. l., Mt. Vernon, Skagit Valley, Wash.

lepta Merriam, like *streatori*, but smaller; black tip of tail very much shorter. T. l., Silverton, San Juan Co., Colo.

murica Bangs, smallest of all; but little larger than *rixosa;* dull drab brown in colour above. T. l., Echo, El Dorado Co., Calif.

arctica Merriam, larger than *cicognanii*; under-fur white; under parts deep yellow; tail, terminal half black, under side of basal half yellow. T. l., Pt. Barrow, Alaska.

polaris Barrett-Hamilton, much like *arctica*, but under parts deep primrose yellow. T. l., Hall Land, Greenland.

audax Barrett-Hamilton, like *arctica*, but white below. T. l., Discovery Bay, North Greenland.

kadiacensis Merriam, akin to *arctica*, but smaller; terminal half of tail black. T. l., Kodiak Island, Alaska.

haidarum Preble, like *kadiacensis*, but smaller, and with more black on tail. T. l., Massett, Queen Charlotte Id., Canada.

Some authorities group the last five together as constituting the distinct species *arctica*, but the habits and disposition of all are much the same.

The Five Kinds of Weasel

There are four groups of Ermine Weasel of wide distribution in North America. All turn white in winter.

1. The Short-tailed Weasel (*M. cicognanii*). This is about 12 in. in total length, of which the tail is 4 in. and slender. It is brown above, with white under parts. The tail-tip is black.

2. The New York Weasel (*M. noveboracensis*). This is about 15 in. in total length, of which the tail is 5 to $5\frac{1}{2}$ in. It is brown above, with white under parts, more or less washed with yellow; tail-tip for one third is black.

3. The Long-tailed Weasel or American Stoat (*M. longicauda*). This is about 18 in. long, of which the tail is 6 in., and rather bushy. It is

brown above, with buff or pale yellow under parts. The tail-tip is black.

4. The Least Weasel (*M. rixosa*) which is about 6 in. in total length, of which the tail is 1 in. It is brown above, clear white below, and there is no black tip to the tail.

It completes our present list of Weasels, if to this we add:

5. The Bridled Weasel (*M. frenata*). This is as large as the Long-tailed, being 20 in. in length, with even longer tail, i. e., 8 in. In colour, it is deep rich brown above, and yellow below. It has, further, a blackish-brown head on which are some curious white markings. Its tail-tip is black. This species does not turn white in winter.

Range of Bonaparte's Weasel

The range of this Weasel extends in the great coniferous forest from the Atlantic to the Pacific. It is never on the open dry prairies, rarely in open marshes, or on bleak rocky mountains. On the north, it ends only at the limit of trees. Beyond that, it is replaced by its near kinsman, the Arctic Weasel, which possibly ranks as a distinct species.

The following are interesting records for *cicognanii*.

"About the year 1870," says Dr. E. A. Mearns, "I trapped one or two of these little Short-tailed Weasels on our place at Highland Falls, and I have seen a few of them since. It is probably quite uncommon."[6] According to S. N. Rhoads, it is "a very rare animal; only found in the most boreal situations in Pennsylvania."[7]

W. F. Henninger gives us a new record for New Bremen, Ohio. "On Feb. 2, 1921," he says, "Mr. Franklin Grothaus, a young farmer of my parish, brought me a fine female of *Mustela cicognanii*. For years the State of Ohio has been searched for this species, but the fact that the closest point to Ohio where it had been taken was in Pennsylvania, about 600 miles from here, and in Michigan, about 500 miles to the north, made it unlikely that it ever would be found. It is with pleasure that I record this new species for the State of Ohio. Measurements: Length, 268 mm.; tail, 67 mm.; h. f., 30 mm. The specimen is now in my collection."[8]

I find notes on the Least Weasel taken in Ohio, at least 6 or 8 times. But I am nearly certain that in each case, the specimen was a Short-tailed Weasel. In view of the doubt, details are omitted.

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[6] Hud. High., 1898, p. 349.

[7] Mamm. Pa. & N. J., 1903, p. 168.

[8] Journ. Mamm., Nov., 1921, p. 239.

MAP XI.—RANGES OF SHORT-TAILED WEASEL, ARCTIC WEASEL, BLACKFOOTED FERRET, AND BRIDLED WEASEL

By E. T. Seton, with assistance of the Biological Survey

One Ohio record of Short-tail.
Blackfooted Ferret, each definite record spotted.
Bridled Weasel, Bailey's records in Texas spotted.

Range of the Arctic Ermine

The map indicates its range in general, though, doubtless, many of the Arctic islands not yet tinted, will be added. The following records are of interest:

"J. C. Ross recorded *Mustela erminea* from Victoria Harbor, where it was not numerous.[9] Armstrong records two Weasels, probably of this species, which were killed at Mercy Bay, Banks Land, in July, 1852.[10] M'Clintock recorded the 'Ermine' from Port Kennedy, where one was taken on Oct. 2, 1858. Its extreme length was 13 inches. Another, in the summer coat, was taken on July 2, 1859.[11] Hubert Darrell writes me that he saw Weasels on the Barren-grounds near the source of Great Fish River in Dec., 1900, and thinks that they are found in small numbers along the coast between the Coppermine and Bathurst Inlet."[12]

Greely found the Ermine common in Grantland. He mentions seeing it many times throughout his "Three Years Arctic Service," 1886.

Rasmussen says: "Ermine occasionally observed" on north coast of Greenland.[13]

"The Ermine (*Mustela erminea*) was found everywhere; but, like the Lemming, it is comparatively seldom seen. Several specimens, however, were shot during the course of the expedition."[14]

On August 20, 1907, I secured a fine male specimen at Clinton-Colden Lake, and on that same day, near Sandhill Bay, Lake Aylmer, I found a white owl's pellet with the skull of a Weasel in it.

Haunts and Home Range

This is a forest animal, found chiefly on the ground; but capable of climbing, when it must, with quickness little inferior to that of the Squirrel. Though a wood-dweller, I have seen it a mile from cover on the open prairie, where it seemed very much at home in the holes of the Striped Ground-squirrel (*C. tridecemlineatus*).

The habit of all Weasels, as far as known, is to quarter themselves on a good cover or game range, killing everything they can catch, until driven out by a stronger one, or till their havoc has spoiled the hunting; then they

[9] App. Ross's 2d Voy., 1835, p. x.

[10] Narr. Disc. N. W. Pass., 1857, p. 537.

[11] Voy. Fox, 1860, pp. 185, 292.

[12] Athabaska-Mackenzie, Preble, 1908, N. A. F., 27, p. 233.

[13] Greenland by the Polar Sea, 1922, p. 299.

[14] New Land, II, by Otto Sverdrup, 1904, App. III, by E. Bay, p. 479.

travel on in search of new grounds. They will go a mile or two in a night, and apparently without definite direction. If they find a barnyard, or a promising place of any kind, they remain and slaughter as before. If they be killed, the place may continue unweaselled for months, but another wandering devil is likely to appear, and repeat the destruction of the first.

There is, no doubt, a limit to the wandering of the Weasel; otherwise, each species would be continental in range. But I do not know where the line is drawn. The argument of analogy would lead us to believe that in the case of the Brown Weasel, a ten-mile round would probably represent the extreme wanderings of the individual.

Numbers and Fur

In Manitoba, when this Weasel was supposed to be common, I did not see more than 3 or 4 in the course of a season. This, however, was largely the fault of my prairie surroundings. Had I been trapping for them, I should doubtless have found many more. For the estimate I formed on the evidence of tracks and destruction, was several Weasels to each square mile in the wooded country.

In the winter of 1900–01, it was extraordinarily numerous in Manitoba. George H. Measham wrote me from Woonona, Shoal Lake, Jan. 17, 1901: "Charles Tweeddell has trapped over 40 of them just around the shore where the boats were. It is strange how these animals seem suddenly to get numerous, and as suddenly disappear."

Similarly, Osgood writes of the Northern form, as he saw it in Alaska: "A series of 42 specimens was secured within a radius of 500 yards from our camp at the head of Seward Creek, all caught in 4 traps [in one month]; so it is evident the animals were very abundant. A single trap in one location caught 3 Weasels in one day. Of the 42 specimens, 28 are males, and 14 females."[15]

The most complete observations at hand are by J. Dewey Soper. He writes of this Weasel:

"At Edmonton, they were very common during 1912–14. In two or three weeks each of two winters, I trapped about 60 Ermine over an area of not more than 9 square miles. A great deal of this area escaped the trap in running the lines, making it safe to discount one third, leaving 6 square miles. I believe that when I ceased operation nearly as many remained free as were taken. Halving 60 for the one year, and doubling for the supposed original population, we have 10 Ermine per square mile. I do not consider this figure in the least excessive for the wooded, northern portion

[15] N. A. F., 30, 1909, p. 30.

of Alberta. That portion of the province, say from Edmonton to Fort Smith, would thus yield about 1,478,750 Weasels. About 1 in every 10 of this number would undoubtedly be *longicauda;* that is, one of the latter and 9 *cicognanii* to the square mile.

"North of Jasper Park on the Hay River, during the fall of 1913, a friend and I in 8 weeks' trapping for this animal, took about 80 skins. Whether these were all *M. cicognanii* or not, I cannot now say. I queried this point under *longicauda.* As the territory trapped, up the valley of the Hay River, Fish Creek, and other tributary streams, did not exceed 30 linear miles, one quarter of a mile in width, we have only a total of 8 square miles. Again, this is 10 Weasels to the square mile, coinciding with the Edmonton figure; with this difference, however, that the number of the trapped animals is not doubled to indicate the probable total population. This is because over the restricted area of the valleys and the prolonged period of trapping, I believe most of the Weasels were taken. At Edmonton, this was not the case. In the former instance, a certain influx of animals from adjacent areas may have occurred as the competitive influence was removed from the valleys, thus lowering the figure somewhat per square mile, but I do not think a Weasel travels widely in a wooded country like western Alberta."[16]

In the early days of the fur trade, American Ermine was of such little value that the traders did not collect them at all. But the steady upward trend gave them place at last.

R. MacFarlane records that, in 1903, the Hudson's Bay Company exported 33,883 Ermine skins.[17] Probably four fifths were of the Short-tailed kinds.

In the London Fur Sales at Lampson's, March, 1906, 80,000 Ermine were sold.

In the seasons of 1919–20, 1920–21, 1921–22, 1922–23, and 1923–24, the numbers of Ermine pelts marketed in Canada were, according to the official reports, 479,991; 386,034; 450,372; 362,236; 359,334. These figures indicate an annual destruction of at least 500,000; which, since it makes no obvious difference in their numbers, presupposes a population of 2,500,000 on the whole range.

This is one of the species that supply the famous Ermine fur of commerce, but it has not the enormous value that one sees ascribed to it in reckless print. Not several dollars, but a few cents, are the usual equivalent

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[16] Can. Field Nat., Sept., 1919, pp. 46–47.

[17] Mamm. N. W. Terr., Proc. U. S. N. M., 1905, p. 713.

PLATE LXXXIX.—THE DEMON OF MURDER

Drawn by E. T. Seton, to illustrate Audubon and Bachman's incident of the Brown Weasel that wantonly massacred the Chipmunk family

PLATE XCIV.—THE LEAST WEASEL
Drawn from a specimen taken at Morden, Manitoba

of a skin. The value is so low that until lately few trappers thought them worth skinning.

At the London Fur Sales, in 1906, the highest price for Ermine was 7 shillings and sixpence ($1.80) a skin for prime white Siberian, without yellow tint. Prime American and Canadian skins brought only 4 shillings (96 cents). Other grades ranged from that down to sixpence (12 cents) for third class.

Even in the great fur boom of 1919–20, the average price for Canadian skins was only $1.25, and in the following seasons, it fell to 49 cents and 52 cents.

The total value of Ermine pelts taken in Canada during the 4 years ending with 1923–24 was respectively $189,936; $248,469; $219,306; $290,812.

Mating and Den

Little is known of the mating of this animal. There is some reason for believing it takes place about the third week of March, and that the species pairs; but the male does not trouble his head about wife or family after the love season is over—though there may be some exceptions to this, as the following cases show:

Charles G. D. Roberts tells me that one day when he was a boy, living in Westmoreland Co., N. B., he was sitting in a field near a stone heap, by the edge of Tantramar Marsh, when two large Weasels (Ermine) came out of the stone pile and ran around him in a manner so threatening that he was afraid of them. He remained very still, and at length they disappeared into the stone pile. He took them for a pair, as they were obviously associated, and he thinks the nest was in the pile. As *cicognanii* is the only species of the size known from New Brunswick, the identification is good.

E. A. Samuels records having seen a *pair of Weasels* pursuing a Chipmunk about the middle of June, 1901, near Fordham, N. Y.[18] The present was probably the species he saw, and the fact that two were united at that season for a common purpose is a shred of evidence that the species pairs.

John Burroughs tells me that one summer in the Catskills, when he was a boy, he saw two old Weasels and three young ones together run across an open lane.

In an incident related by S. E. Percival, of the Ottawa Normal School, and given in full later, two adult Weasels took part in the moving of the young from a home-den that was threatened with destruction.

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[18]Forest & Stream, July 27, 1901, p. 66.

And again this same observer cites the following record, given him by H. De Pencier, a friend whom he considers absolutely reliable:

"While near a chicken coop which I believed to have been visited by Weasels, I saw a mother Weasel emerge from a hole, some distance away, carrying one of her young. After she got away from the hole, I ran and tried to kill her with a fork. I did not get her, but I killed the young one. She soon came back, and the male Weasel was with her. Both began at once to try to get the body of their young, and although I did my best to strike them and beat them off, they got the dead body into the hole. They moved so quickly about the place, and so near my feet, that I couldn't strike them."

In the case observed at Albany, N. Y., by Sherman C. Bishop, both parents were present with the young (see later).

From these facts, then, we may assume that this Weasel pairs, and that the male, sometimes, at least, takes an interest in the young.

The first detailed evidence I can find on the dens of this Weasel is as follows:

John Burroughs, in November, 1893, saw a Brown Weasel carrying Mice into its burrow, as narrated in the paragraph on Storage. He dug after it for several hours one day. Next day he returned with better tools, and tried again, moving over a ton of rooty earth and exposing many more galleries, but finding no larder. He found, however, several little expansions, and at last "one of his banqueting halls, a cavity about the size of one's hat, arched over by a network of fine tree roots. The occupant evidently lodged or rested here also. There was a warm, dry nest made of leaves, and the fur of Mice and Moles. I took out two or three handfuls. In finding this chamber, I had followed one of the tunnels around till it brought me within a foot of the original entrance. A few inches to one side of this cavity, there was what I took to be a back alley, where the Weasel threw his waste; there were large masses of wet, decaying fur here, and fur pellets such as are regurgitated by hawks and owls. In the nest, there was the tail of a Flying-squirrel, showing that the Weasel sometimes had this game for supper or dinner."[19] After this, the Weasel's labyrinth seemed to grow complicated as well as expand to include the neighbouring country, and the digger had to give it up without finding the store of Mice. A tunnel so extensive, Burroughs thinks, must have been the work of many seasons, and therefore a permanent home of this Weasel.

[19] Squirrels, pp. 77–78.

S. Eldon Percival, of Burritt's Rapids, Ont., contributes the following interesting details:

"On one occasion, as we were removing the sheaves from a large mow at a threshing bee, near the village of Burritt's Rapids, we were struck by the appearance of a Weasel at widely different points about the barn. The little creature seemed greatly distressed and agitated. The men regarded it with a certain amount of interest and amusement, wondering what in their work was causing the little animal so much of apparent worry and excitement. In a very short time, however, the problem was solved. About halfway down in the mow, the men opened up some peculiar but luxurious apartments, which had evidently been the home of the uneasy Weasel. The home was lined throughout with the soft fur of Mice. The floor had an extra thick covering, and in the centre, evidently to take the place of the modern rug, was neatly spread the skin of our pet kitten which had mysteriously disappeared some days before. This room appeared to be the main living room, and was about the size of an ordinary water pail.

"From this room, a winding passage led into another room which presented a rather ghastly appearance, being strewn with the bodies of dead Mice, bones, fur, etc. From this commissariat apartment, as well as from the living room, passages and cross passages extended in all directions horizontally, forming quite a perfect system of highways."[20]

It is nearly axiomatic that no creature can develop a permanent and comfortable home, without adopting a considerable measure of sanitation.

One of the most interesting features in the Weasel den described, was the midden heap. Others have reported the same thing, and in my menagerie, I found that the Weasels were careful always to keep a special corner of the cage for the dung pile and health department.

When we find an animal far enough advanced to purify its nest by appointing and keeping apart a place for garbage and filth, we must honour it for having advanced the first degree in sanitation, and even for having taken a step toward civilization.

The Young: Bearing and Borning

The period of gestation in our Ermine is unknown, but A. H. Cocks found it to be about 40 days in the British congener.

The young number from 4 to 8, are usually 5 or 6, and doubtless, like Stoats, they are blind for some nine days after birth.

On May 14, 1921, in a field within the city limits of Albany, N. Y., a pair of Short-tailed Weasels were found with the nest and 4 young (3 ♂,

[20] Ottawa Field Naturalist, June, 1910.

1 ♀). Sherman C. Bishop, who describes it, calls attention to the remarkable mane on the neck of the young he figured.[21] It is noteworthy that both parents were present and interested in the home.

In her ordinary life, the old Weasel walks to and fro, far and near, throughout the earth, seeking whom she may destroy; but in spring, as we see, she responds to the home love and, for a time, is chained to the nest with the young. She hides them with care, nurses them with tender and truly musteline assiduity, and guards them with a marvellous courage, until in late summer when they are about six or eight weeks old; then they are strong enough to follow her about, and she resumes her travels at the head of her half-dozen budding cut-throats, and leaves a trail of destruction still wider than before.

Fragments of their life have been recorded. Thus, J. Dewey Soper says: "On June 1, 1910, northeast of Guelph, Ont., I saw a Weasel carrying a young one in its mouth, as it followed along the bottom of a fence leading from a strip of woods. This individual may have been *M. cocignanii*."[22]

One of the most amusing incidents in point is supplied by S. Eldon Percival, who received it from a friend, as follows:

"One day while returning from the fields through a lane, he heard before him a most distressed and dismal squealing. Approaching cautiously, he observed two adult Weasels, each leading by force one of their incorrigible offspring, while two others came quietly along in the rear. There was evidently some cause for a sudden change of quarters. He was unable to watch them long enough to determine their destination, but knowing, as we do, the nature of the most luxurious quarters they must have been forced to leave, we cannot blame the young ones for going so reluctantly from it. Again, when we note with what determination the parent Weasels persisted in placing their young ones in safety, we can here, at least, find in this ever-alert lover of blood, so much dreaded by other wild and innocent creatures, at least one characteristic worthy of our admiration."

In the case observed by John Burroughs, the mother showed her ready devotion, for he fired at the young ones, wounding one of them so it could not run, but the mother seized it in her mouth and bore it away to safety.

The superb and devoted courage of the mother, the desperate fighting courage commonly accredited to the father, seem to be the developments of the mature character. The following incident, by Ed. R. Warren, would imply that the young, in some cases at least, are not in their earliest months

[21] Journ. Mamm., Feb., 1923, pp. 26–27.

[22] Can. Field Nat., Sept., 1919, p. 46.

endowed with the traditional valour of the race, or perhaps that among the grown-up Weasels there are freaks that never are brave.

While camped in the Yellowstone Park, summer of 1923, Warren was at Camp Roosevelt. Here he saw a number of incidents which showed that the Ground-squirrels (*Citellus armatus*) were not at all afraid of the Weasels, easily driving them away from their haunts. The Weasels were a young one of *arizonensis* and a full-grown *cicognanii*.[23] This story, however, belongs properly to the Life of the Ground-squirrel.

As already noted, the father, in some cases, at least, is active in the care of the young.

So far as known, there is but one brood a year.

Food and Drink

The Weasel preys on every kind of bird and beast that it can master, and this means everything from turkey and Rabbit, down to tomtit and Shrew. On the list of its prey, we find recorded all kinds of domestic poultry, all wild birds that it can catch, Rats, Mice, Squirrels, Chipmunks, etc. It is the most villainous of murderers, when it finds an open way to the chicken-house.

Bachman tells of 40 well-grown fowls having been "killed in one night by a single Ermine. Satiated with the blood of probably a single fowl, the rest, like the flock slaughtered by the Wolf in the sheepfold, were destroyed in obedience to a law of nature, an instinctive propensity to kill. We have traced the footsteps of this blood-sucking little animal on the snow, pursuing the trail of the American Rabbit and although it could not overtake its prey by superior speed, yet the timid Hare soon took refuge in the hollow of a tree, or in a hole dug by the Marmot or Skunk. Thither it was pursued by the Ermine and destroyed, the skin and other remains at the mouth of the burrow bearing evidence of the fact."[24]

Kennicott records that in a single night and the early part of the following evening, one of these killed nearly 50 chickens, several of which were adults, and many half grown.[25]

"Wherever an Ermine has taken up its residence," says Bachman, "the Mice in its vicinity for half a mile around have been found rapidly to diminish in number. Their active little enemy is able to force its thin vermiform body into the burrows, it follows them to the end of their galleries, and destroys whole families. We have on several occasions, after a light

[23] Journ. Mamm., Nov., 1924, pp. 265–66.

[24] Q. N. A., II, p. 58.

[25] Quads. Ill., 1859, p. 244.

snow, followed the trail of this Weasel through the fields and meadows, and witnessed the immense destruction which it occasioned in a single night. It enters every hole under stumps, logs, stone heaps, and fences, and evidences of its bloody deeds are seen in the mutilated remains of the Mice scattered on the snow.

"The little Chipping or Ground-squirrel, *Tamias lysteri*, takes up its residence in the vicinity of the grain fields, and is known to carry off in its cheek pouches vast quantities of wheat and buckwheat to serve as winter stores. The Ermine instinctively discovers these snug retreats, and, in the space of a few minutes, destroys a whole family of these beautiful little *Tamiae;* without even resting awhile until it has consumed its now abundant food, its appetite craving for more blood, as if impelled by an irresistible destiny, it proceeds in search of other objects on which it may glut its insatiable vampire-like thirst.

"The Norway Rat and the Common House-mouse take possession of our barns, wheat stocks, and granaries, and destroy vast quantities of grain. In some instances, the farmer is reluctantly compelled to pay even more than a tithe in contributions towards the support of these pests. Let, however, an Ermine find its way into these barns and granaries, and there take up its winter residence, and the havoc which is made among the Rats and Mice will soon be observable. The Ermine pursues them to their farthest retreats, and in a few weeks the premises are entirely free from their depredations. We once placed a half-domesticated Ermine in an outhouse infested with Rats, shutting up the holes to prevent their escape. The little animal soon commenced his work of destruction. The squeaking of the Rats was heard throughout the day. In the evening, it came out licking its mouth, and seemed like a hound after a long chase, much fatigued."[26]

At Ingolf, Ont., Sept. 16, 1904, I saw a specimen of this Weasel that had been shot by the station agent. He told me that there were five or six Rabbits each night about the station. But one day, the Weasel took up its abode near by, and the Rabbits disappeared. The Weasel came into the station one night and, by help of the Dog and a stick, the man injured it, but it escaped through a hole in the mosquito bar. Next day, it was back, and he killed it with a shotgun. The pertinacity of the animal in returning was very characteristic.

Dr. E. E. Bowen tells me that in the August of 1914, while camped on the Restigouche, she heard a rustling in the bushes, and saw a big bobtailed Meadowmouse pursued by a Weasel. The Mouse took fearlessly to the

[26]Q. N. A., II, pp. 59–60.

river and escaped the Weasel, but when nearly across, up came a big speckled trout, and swallowed the Mouse at a mouthful.

Interesting for the spectator, the Weasel, and the trout, but distinctly hard on the Mouse.

The British Stoat is credited with a crafty device for approaching an overswift prey, a ruse of approach where the quarry is in a place that makes stalking impossible. That is, he rolls on the ground, turns somersaults, and gambols in a dozen curious ways, all quite openly. This tends to arouse the curiosity of the victim, or to lull his suspicions. The Stoat tumbles ever nearer, till at last the intended prey is within reach of a sudden spring.

Millais gives a number of instances of this clever hunter-craft. So far, it has not been reported for any of our Weasels, but is more than likely to be seen, as young naturalists and careful observations increase.

Concerning its drinking habit, the Criddle brothers write: "Weasels like water both for drinking and washing themselves. A bird trough, placed conveniently for observation purposes, was frequently visited by these animals. In drinking, they held their mouths very close to the water, and, as far as we could see, lapped the liquid up with rapid movements of the tongue. As a rule, after drinking, they would merely spring to the ground and vanish amid a bunch of scolding birds, but occasionally we have seen an animal slowly drag itself through the water, and follow this performance by some rapid gambols, or a quick run, a method of drying which most of us have practised in our youth.[27]

Storage Habit

The storage habit is not what we look for in a creature so reckless and wasteful as a Weasel, and yet it seems fairly well developed in this species. Bachman, after the above experiment with the Ermine as a ratter, says:

"A board of the floor was raised to enable us to ascertain the result of our experiment, and an immense number of Rats were observed, which, although they had been killed in different parts of the building, had been dragged together, forming a compact heap."[28]

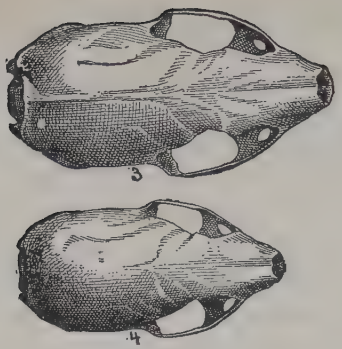
Again, he says that he has known the Ermine to kill and cache in the snow a Cottontail Rabbit, pressing the snow tightly down over it.[29]

John Burroughs gives another curious case of Weasel storage, in connection with the den already described. He saw the creature (*cicognanii*) carrying a Mouse into a hole about every fifteen minutes, till 4 were stored

[27] Weasels So. Man., p. 143.

[28] Q. N. A., II, p. 60.

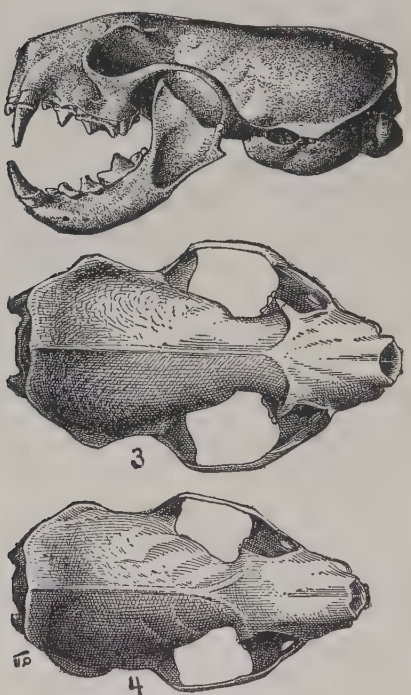
[29] As above, p. 58.



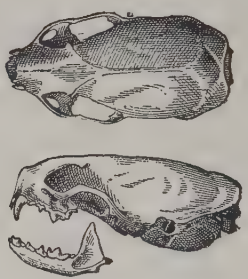
Skulls of Short-tailed Weasel
3. Adult male
4. Adult female

Skull of Short-tailed Weasel
adult ♂, from Elk River, Minn

From C. H. Merriam's Synopsis, N. A. Fauna, No. 11, 1896. Plates II, and p. 11.
Cuts supplied by the Biological Survey, U. S. Dept. of Agriculture



Skulls of Long-tailed Weasel
Uppermost, side view of adult ♂ skull.
Middle, top view of adult ♂ skull from Carlton House, Sask.
Lowest, top view of adult ♀ skull from Carlton House, Sask.
Cuts from Merriam's Synopsis of Weasels. N. A. Fauna, No. 11, 1896 p. 20, and Plate III. Supplied by Biological Survey, U. S. Dept. of Agriculture



Skull of *M. rixosa*, the type
From Merriam's N. A. Fauna 11, Biol. Surv., Dept. Agr., U. S.

PLATE XC.—WEASEL SKULLS

within; the next day, the same thing went on, till 4 more were carried in before his eyes, and doubtless others he had not seen. So he set to work to dig out and examine this larder; but the farther he went, the more branches the tunnel had, and after many hours' digging, he gave it up.[30]

Kennicott credits the kindred species (*noveboracensis*) with collecting in a particular spot, the Rats and Mice it had slaughtered, until a hundred or more of the victims were in the pile.[31]

Discussing the Short-tailed Weasel as a killer of Mice, the Criddle brothers write: "On one occasion, indeed, on moving some straw, we came upon 11 of these rodents, all neatly placed in a heap."[32]

As the Weasel usually craves hot, fresh blood, and a living prey, I am puzzled to understand its occasional wabblings toward the frugal habits and virtuous ways of much better citizens.

Value to Man

The gruesome chapter of carnage and woe that appears under the section on habits and food, might lead one to list the Weasel among things to be destroyed at all times, and by any means, as a creature without redeeming qualities. But Kennicott, after years of close acquaintance, says: "I have frequently found the half-eaten remains of Meadow-mice in their burrows or under corn-stacks, which had doubtless been destroyed by this Weasel (*noveboracensis*), or perhaps the smaller one (*P. cicognanii*). It is a surprising thing that an animal so large as this should be able to force its way into the burrows of Meadow-mice, and yet it appears to do so without difficulty.

"Stacks and barnfuls of grain are often overrun with Rats and Mice; but let a Weasel take up his residence there, and soon the pests will disappear. A Weasel will occasionally remain for some time in a barn, feeding on these vermin without disturbing the fowls.

"Indeed, I am inclined to think that, notwithstanding their occasionally predatory inroads, they should not be killed when living permanently about meadows or cultivated fields at a distance from the poultry."[33]

The Weasel, then, like so many of our carnivores, will eat any living thing it can master, but probably counts on Mice as its steady diet the year round.

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[30] Squirrels, pp. 72–75.

[31] Quads. Ill., p. 106.

[32] Weasels S. Man., p. 145.

[33] Quads. Ill., p. 105.

If Mice are the unmitigated curse that most folks believe them, the Weasel is one of our most valuable plague-destroying friends.

The Criddle brothers offer the following summary of this Weasel, and of Weasels in general:

"We have no record of Bonaparte's Weasel killing poultry, and we doubt whether it ever does so. Doubtless, the young of some wild birds are captured, but we must recall the fact that this can only happen during a limited period of the year. At other times, the destruction of birds is seldom possible, and the Weasel is consequently obliged to turn to Mice for food."

. . . . . .

"In the last 20 years, we have permitted Weasels to frequent the farm buildings at will, and the poultry-house has been no exception. In that time, Rats and Mice suffered severely from the Weasels, while the total number of poultry taken were 6. Many times that number, however, have been killed by Rats.

"When we review our experiences of the past, we are astonished to find what few poultry have been killed by Weasels. Our own losses in 42 years have not exceeded 15 birds, and even these were usually eatable. There have been reports of losses from time to time from neighbours, but on looking into details, we find that there are very few farmers who have experienced more than 3 separate occasions of Weasel depredation, and the total loss per farmer in the last 30 years does not, we are sure, exceed 10 birds. This is surely a remarkably small payment to Weasels in general for the great good done by them in killing rodents."[34]

The commercial value of the fur has already been set forth.

His Way of Life

At Carberry, I have often seen this energetic little creature seeking for Mice in the deep, soft snow. Its actions are much like those of an Otter pursuing salmon. Sometimes it gallops along a log, or over an icy part of the drift; then plunges out of sight in a soft place, to reappear many yards away, bounding here and there, over and under, restless and tireless as the waves of the sea—for ever changing his place, pose, and direction; an embodiment of lithe grace and endless assiduity. At such times, if he disappears in some crevice, hole, or maze, he is easily persuaded to come forth again, if one remain still and squeak like a Mouse.

The smell of blood must be as far-reaching as it is attractive to these

[34] Weasels So. Man., p. 145.

sanguinary little creatures. I have frequently hung new-killed Rabbits and partridges temporarily in trees, and, after an absence, in some cases of a few minutes only, have found an Ermine mauling the game, though there was no sign of such a visitor when the cache was made.

The Weasels have the unloveliest disposition of all our wild animals. Outside of their strength and courage, we find in them little to admire. Most other creatures have a well-marked home region and friends, but the ordinary life of a Weasel is that of a wandering demon of carnage. Doctor Coues has tersely summed up the Weasel, body and soul, in a few characteristic lines:

"A glance at the physiognomy of the Weasel, would suffice to betray their character. The teeth are almost of the highest known raptorial character; the jaws are worked by enormous masses of muscles covering all the sides of the skull. The forehead is low, and the nose is sharp; the eyes are small, penetrating, cunning, and glitter with an angry green light. There is something peculiar, moreover, in the way that this fierce face surmounts a body extraordinarily wiry, lithe, and muscular. It ends a remarkably long and slender neck, in such a way that it may be held at right angles with the axis of the latter. When the creature is glancing around, with the neck stretched up, and the flat triangular head bent forward, swaying from one side to the other, we catch the likeness in a moment—it is the image of a serpent."[35]

The thugs of India claim to be devotees of the Goddess of Destruction; and profess, therefore, that it is their duty to kill as many human beings as possible. The Weasel is the Thug of the Wild World. While other animals may kill to excess for the gratification of appetite, the Weasels alone seem to revel in slaughter for its own sake, to find unholy joy in the horrors of dying squeak, final quiver, and wholesale extermination. Gifted with tremendous strength and activity; at home in the tree-top, beneath the snow, on the earth, underground, or in the water; keen of wits, tireless of wind and limb, insatiably cruel and madly courageous, the Weasel is all too well equipped for his chosen Herodian task.

The Trail That He Leaves

The winter woods of his haunt is usually a broad white sheet, with a million pattering tracks and winding trails that are the telltale record of a wee white demon. Judging by the number, we might suppose a thousand of these small fiends, and wonder why the tracks are everywhere, and the creature so seldom seen.

[35] Fur-bearing, p. 129.

Bachman made a curious observation on this point. He found that, though there were myriads of tracks in the woods, there were none at all after two or three Weasels had been taken. So that really each Weasel is a never-tiring track-maker, grinding out tracks by the minute and the mile, and the score of miles twisting and circling, round and round, and punctuated every little while with a red spot in the snow.

Soper has given us some observations which show the trail at once a record of the creature's character and boundless vital force:

"The Ermine trail," he says, "may easily be distinguished from that of all other animals by its size, in conjunction with the symmetry of its paired tracks. The Mink trail is similar, but very much larger. The hind feet register almost, if not exactly, in the front foot impressions, with the right front and hind feet lagging slightly behind. The sequence of tracks with a bounding animal is not as regular between individual impressions as that of a running or walking animal, due to the variation in the length of jumps from time to time. The Ermine, being a bounding animal, leaves a wide range of space lengths between imprints. The distance normally is about 19 inches, representing a regular rate of travel. The 'jumps,' however, depend entirely upon the mood, purpose, or demands of the traveller. Sometimes they are no farther apart than 6 or 8 inches; obviously the Ermine is slowing down for more acute observation, scents prey, or some similar reason. In traversing open spaces, they resort to long, graceful leaps upwards of 6 feet in length. On Jan. 5, 1919, I measured a record for *M. cicognanii*, a remarkable jump of 8 feet 2 inches. The larger species should naturally be able to exceed this, but whether they do or not, I am unable to say."[36]

To the young, oncoming naturalist, I would say: Never forget the trail, look ever for the track in the snow; it is the priceless, unimpeachable record of the creature's life and thought, in the oldest writing known on earth. Never forget the trail!

Speed, Ashore and Afloat

Whatever a Weasel does, is done quickly—whether it be to seize the bounding Squirrel, clinch on the rash terrier's nose, elude the rifle ball at the flash, or save its young—it is sure to act like lightning, and with nearly uniform success.

Measured by miles per hour, I doubt not its speed on the ground would be low, but in dodging, it is quick to bafflement of the eye and the gun. In the trees, it is perfectly at home, much more so than a Chipmunk, if not quite in the Red-squirrel class.

[36] Can. Field Nat., Sept., 1919, p. 46.

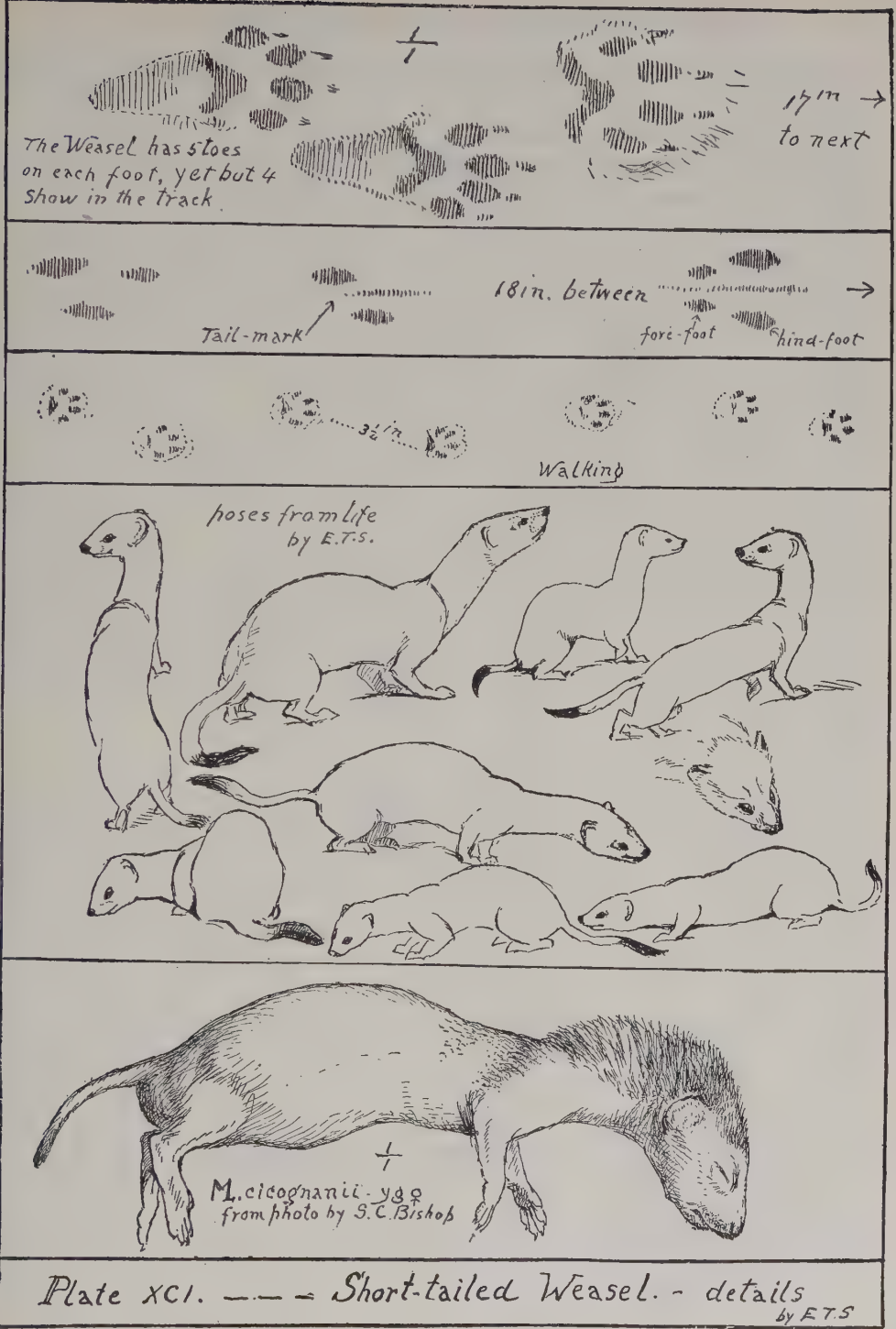

Plate XCI. — — Short-tailed Weasel. - details by E.T.S

Bachman writes thus of one: "To avoid a Dog that was in close pursuit, it mounted a tree, and laid itself flat on a limb about 20 feet from the ground, from which it was finally shot."[37]

Also it is a good swimmer. The following was observed by J. W. Curran, of Montreal, while camped at Lake Couchiching, Ont., in July, 1899:

"About 50 yards away from us, a Chipmunk jumped off a tree overhanging the water, and plunged boldly in, followed at a distance of not more than 3 feet by a Weasel. It was a great jumping contest, and our hearts were with the little fellow in front. However, we remained neutral. For 25 yards, things looked black for the Chipmunk. The Weasel pulled up slightly—probably a foot—and we prepared to go and give a hand. It was a fast race, too, the pair easily beating the best swimming I ever saw a Dog do. The Weasel, I think, showed more of his body, and seemed to exert himself more. After the first spurt, the Chipmunk managed to hold the lead, and at the end of 100 yards or less, the Weasel, completely blown, suddenly threw up the sponge, and wheeled around for the shore, his successful competitor keeping right on for another island a quarter of a mile away.

"I think a Chipmunk, and probably a Black-squirrel, can beat a Weasel swimming, and also that Weasels do not depend entirely on smell when after a meal."[38]

Enemies and Disease

If Weasels were to be greatly multiplied, they would quickly destroy every small bird, beast, and reptile in the country. Fortunately, they are nowhere abundant. Although prolific, and comparatively safe from the attacks of bird and beast of prey, they never become numerous. The reason lies, partly, I believe, in their own ferocity. It is generally believed that numbers of Weasels are killed by Weasels. Two cannot live in the same thicket; one of them must fall or flee. It is probable, too, that an unusual increase in Weasels results in such wholesale extermination of their prey that local famine awaits these bloodsuckers. In the fights for life that follow, the slightest difference in weight counts, and it appears that females are often overpowered and destroyed by their unchivalrous lords. So that a ruthless check is put on the further multiplication of their race, and their number once more brought to its proper low adjustment.

I have seen one of these Weasel fights between a male and a female, and have seen a duel between Martens in which the female was killed. Sex

[37] Q. N. A., II. pp. 58–59.

[38] Forest & Stream, June 2, 1900, p. 427.

probably counts for nothing among these Weasels, except in the breeding season.

One of the most curious cases of a Weasel meeting his doom, is thus recorded by T. McIlwraith, of Hamilton, Ont. He does not give the species of Weasel, but, from the place, it was most likely the present one:

"Twenty years ago," he says, "I knew a youth who shot one of these birds [Bald Eagle] as it flew over him while he lay concealed among the rushes on the shore of Hamilton Bay watching for ducks. On taking it up he found an unusual appendage dangling from the neck, which proved, on examination, to be the bleached skull of a Weasel. The teeth had the 'death grip' of the skin of the bird's throat, and the feathers near this place were much confused and broken.

"The eagle had probably caught the Weasel on the ground and, rising with his prize, a struggle had ensued in the air, during which the Weasel had caught the bird by the throat, and hung there till he was squeezed and clawed to pieces."[39]

Another case, and very similar, is supplied me by George H. Measham, of Winnipeg. He was studying the tracks of an Ermine, and writes: "The trail indicated that the Weasel went under the stable door. Perhaps he intended to kill a Horse. An Indian hunter states he once found a Weasel [clinging] to the throat of a Moose. It is probable that the Rats and Mice in the stable will have an unpleasant time with their ill-omened visitor.

"Further search revealed that the Weasel had found a way out under a log in the rear, and his trail headed for the woods 100 yards away. Something happened here. The trail came to a sudden stop. Farther on was a crimson splash of blood, and a little farther, two silvery white feathers. Nemesis had overtaken the Weasel in the form of a creature as fierce as himself. He had become the prey of a great snowy owl, and no doubt died fighting to the last."

As noted in the section treating of the number of Long-tailed Weasels, O. Bangs suggests that possibly the parasitic disease which so commonly attacks the frontal sinus, may be one of the causes which prevent their undue increase.

In this connection, be it noted that I never knew a Weasel attacked by the cuterebra or warble, which so commonly plagues the Squirrel and many other small and great fur-bearers. Possibly the fierce odour of the Weasel musk is a sufficient repellent; it certainly is rightly placed for such service.

[39] Birds of Ont., 1894, pp. 209–10.

Social Instincts and Voice

A bloody villain is generally a morose, sullen, and solitary villain. We have charged the Weasel with blood-lust. What are his social ways?

Frankly, the Weasels of this group are neither sociable nor gregarious; they are, indeed, an unlovely lot, no matter how we look at them. Bachman says of the New York Weasel (and I doubt not it might be said of this):

"It is solitary in its habits, as we have seldom seen a pair together except in the rutting season. A family of young, however, are apt to remain in the same locality till autumn. In winter they separate, and we are inclined to think that they do not hunt in couples or in packs like the Wolf, but that, like the Bat and the Mink, each individual pursues its prey without copartnership, and hunts for its own benefit."[40]

Nevertheless, for guidance of future observers, it may be well to remember that the British Stoat, their near kinsman, is known to unite in numbers on occasions for the common good. Thus, E. T. Booth records a case of 20 to 30 uniting to attack a terrier Dog.[41] Millais refers to the well-known fact that a pack of 6 or 8 will unite to hunt.[42] Other cases are recorded of their attacking men.

Furthermore, since we are seeking for precedent in the old land, a most interesting sort of game played by two males and a female Stoat is described by C. B. Moffat, who witnessed it in June, 1890, near Ballyhyland, Enniscorthy, Ireland. All were apparently full-grown. They were chasing each other like Dogs or kittens, knocking each other over, and turning somersaults. "A curious crowing sort of note, 'Curoo, curoo, curoo,' uttered very quickly, was frequently uttered, and invariably when they ran at full speed. Great part of the game consisted in all three animals careering across the road again and again, frequently crossing each other, when they sometimes sprang high in the air, and cannoned against one another, all evidently in the height of fun. Then there was a ceremony, which I could not quite understand, of pressing their noses on the bare ground and running along for a foot or so, making a slight grating noise. I do not know how; they all did this."[43]

There is much evidence of adult British Stoats having games of this sort in summer and in winter, apparently at times when the sex instincts are dormant.

[40] Q. N. A., II, p. 62.

[41] Field, Oct. 6, 1883.

[42] Mamm. Gt. Br., II, pp. 122–23.

[43] Zoologist, 1890, p. 381.

There is little doubt that the insufferable smell of the "stinking" Weasels, was developed originally as a method of inter-communication, as a means of getting at their friends; though not a few, notably the Skunk and in a less degree the present one, have carried it so far that they now find it an effectual means of getting at their enemies.

The sharply demarked white and brown with the black tail-tip are believed to be the uniform or directive labels of this species. They are worn by no other mammal of the size in North America. So far as I know, this Weasel is not civilized enough to use the smell-telephone, as do the Wolf, the Marten, and the Beaver.

All of the Weasels growl, snarl, hiss, or puff, or utter a reiterated explosive sound, which is like a bark in the large species, and a shrill screech in the small ones.

Dice writes of the Arctic species in Alaska: "Weasels, when excited, were several times heard to give a bark, somewhat similar to the bark of the Mink, though not so loud."[44]

Manly Hardy tells of his semi-tame Weasel: "I could distinctly hear him purring, for he was not two feet from my ear"; (see later) and record is made herein of a female, presumably of the present kind, calling her young by a "sort of grumbling coo."

British Stoats, according to Millais, "will stop and bark for a long time at some object that puzzles them. . . . . When playing, Stoats give out a chuckling, happy sound, uttered in a high and a low key. When angry, they make a loud chattering noise, and, when hunting in packs and in full cry, are said to 'give tongue.'"[45]

Fearless and Curious

So far as I know, no one ever tamed a Weasel so that it was truly friendly, trusty, and responsive, as commonly are the tame Mink or Marten. Yet, thanks to its fearlessness and curiosity, this Weasel is very ready to live near, and make a sort of semi-distrustful acquaintance with, the woodman.

Manly Hardy has given us some good notes on this, and at the same time, supplied a word picture of the trapper life. His camp diary runs thus:

"*October 30, Sunday.* Still blows and spits snow. Although alone in the camp, I have company; as, soon after we got settled, a Weasel came to us. At first his back was 'malty'—as we often call a blue-gray—but he soon changed to pure white. He is very tame and seems to like company,

[44]Mamm. Alaska, Journ. Mamm., Feb., 1921, p. 22.

[45]Mamm. Gt. Br., II, p. 23.

as, on our coming home, we sometimes see him running toward the camp. Often when I am alone cooking, he will come halfway out of a knot-hole in the floor, and look me in the face, letting me talk to him as I would to a Cat or a Dog. We have not seen a Mouse, Mole, or Squirrel near the camp.

"One day just after I had hung a saddle of Bear on the end of a rib pole close to the door, and was standing beside it, my Weasel came out from between the two roofs, and began to pat the meat with his fore feet, just as a Cat will pat a bed when about to lie down on it. I could distinctly hear him purring, for he was not 2 feet from my ear. The only writer I remember having stated that a Weasel purrs was a Mrs. Jane G. Swisshelm. As I recall it, she had a tame Weasel, and she spoke of its purring when pleased, and of its patting with its fore feet. I remember that in the fall of 1852, my partner, on going back to a place where he had taken the entrails out of a Deer, told me that when he reached the place, a Weasel sprang upon the paunch of the Deer, and began to pat it with his fore feet as if afraid it might be taken from him."[46]

Later he was setting a Mink trap, and adds:

"This was some 50 yards from our camp, but our Weasel must have seen me go with the trap and bait from our camp, as I had hardly begun to set the trap behind a large spruce before the Weasel came. When I was on my knees fixing the trap, he would look me in the eyes, not 2 feet from my face. As I knew he would be at the bait as soon as I left, I purposely set it too hard for him to spring, for I would not have caught him for the price of several Mink."[47]

Allan Brooks contributes some similar observations. He says of this species: It "does not differ from others of this family, but seems to be of a fearless disposition. I have brought one to eat out of my hand within three hours of making its acquaintance, and this without confining it in any way. This was a female, and later she became a great nuisance. She generally showed up a little before midday and left about three o'clock to continue her rounds. If I happened to be skinning birds, she became greatly excited, and would rush in and try to drag the body from my fingers. A male which used to visit my cabin in the early morning never became so tame. He was a fine specimen of his kind and amazingly strong. He could drag a grouse several times his own weight a long distance over the snow."[48]

Soper offers a delightful picture of wild life in northwestern Canada, in which this Weasel showed its usual dominant traits. He says:

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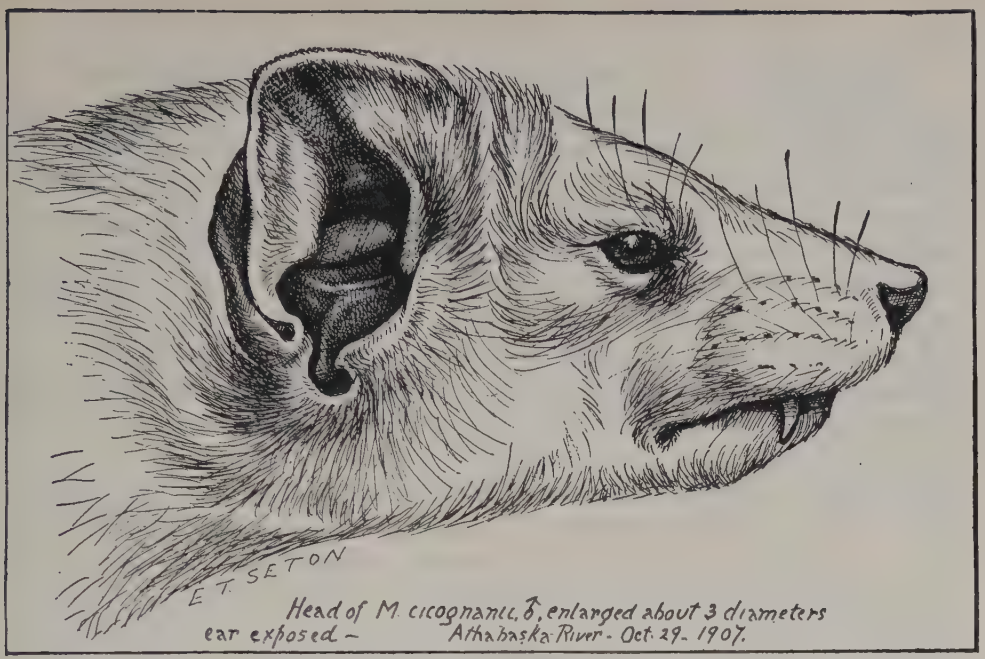
[46] A Fall Fur Hunt in Maine, Forest & Stream, May 28, 1910, p. 850.

[47] Forest & Stream, June 4, 1910, p. 888.

[48] Recreation, Oct., 1902, p. 268.



—Head of Short-tailed Weasel ♂.

Sketched in the flesh at Winnipeg, Aug. 25, 1904 (life size). This is somewhat abnormal in colouring. The light area on throat and on cheek under ear (as dotted) is sulphur-yellow, the rest of the cheek, the chin, lips, and *central* part of snout, pure white.

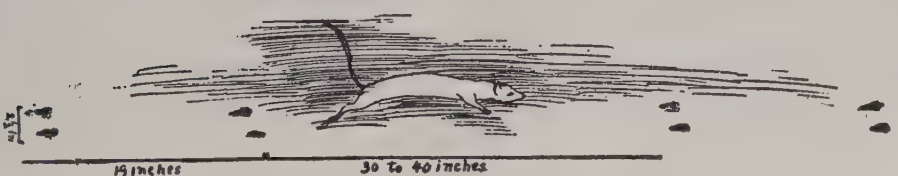


PLATE XCII.—WEASEL DETAILS

"Many interesting experiences happen to a man in the woods. One day I travelled up a long, dark timbered ravine that cut into the White-mud River, southeast of Edmonton. At the base of a big spruce, I had a 'set' for Ermine, which on inspection showed the bait stolen, with some of it in the sprung trap. In a few minutes' hunting, another Hare was secured, with which to replace it. The meat, being warm, was no doubt exuding a tantalizing odour to furtive nostrils, for, as I knelt at the trap, a faint rustle, like leaves in a light breeze, attracted my attention. There was no wind, so I concluded that it was a Shrew, but looking quickly, following a repetition of the sound, I saw a beautiful snow-white Ermine silhouetted among the dark roots of a spruce, not three feet distant. It eyed me for a while, head held high and nose aquiver; then it disappeared. But the next moment, back it came, followed by a rapid series of disappearances and reappearances. I then laid the Rabbit near the roots, and the intrepid little rascal ran out, bit into the meat, and retreated. After doing this for a while, he would pertly mount the Rabbit's carcass with his front feet, draw one foot up under his breast as if it were cold, and gaze me straight in the face. Ambition was now chasing away all discretion. His next move was to bite into the Rabbit's ear, and attempt its removal to the hole. The brave attempts following this consuming desire were indeed very commendable."[49]

Courage and Hardihood

Much as we may hate him for his sanguinary disposition, we are bound to respect the Weasel for his courage. The incidents grouped under the head of Fearlessness, might in many cases be explained as ignorance or stupidity. They are negative as to courage.

But there is abundant testimony of the other kind, and witnesses galore to the positive aggressive courage of this small fighting beast.

It will ordinarily face any animal up to twenty or thirty times its size; a mother Weasel would face and fight an Elephant; she will fly from nothing that may threaten her brood, as we have seen in the section on the Young.

That this animal will sometimes attack man under other circumstances is shown in a case related by Burroughs: The Weasel turned savagely on a man that had interfered with its feasting on a newly killed Rat. It dodged his blows of stick and stone in a way "singularly uncanny and startling. It was like some infuriated imp of Satan, dancing before him, and watching the chance to seize him by the throat, or to dash into his eyes."[50]

[49] Can. Field Nat., Sept., 1919, p. 47.

[50] Squirrels, p. 84.

When courage is purely physical, and therefore not of the highest type, it is pretty sure to crumble under the stress of physical pain and weakness. That this is not wholly the case with the Weasel, we may be convinced by the following incidents:

Dr. E. A. Mearns trapped one on the Schoharie Creek, Catskills, N. Y., Aug. 23, 1896. He says: "It uttered a high-pitched cry of rage, and attempted to attack me when I came upon it in the trap."[51]

"They were very hardy little creatures," says George G. Goodwin, concerning the Short-tailed Weasel as he saw it in Gaspé. "One was caught across the head in a trap and, supposing it to be dead, I knocked it against a tree, which released the jaws of the trap. The Weasel immediately came to life, and shot off into the bushes."[52]

If further evidence of physical hardihood be needed, let us remember that this fearless little freebooter has pushed as far north as there is land, and, even in the blizzard times of north Greenland, is ever alive and afoot, without the possibility of a long winter-sleep that helps so many of the winter-land folk to while away the famine time in dull forgetfulness.

As a final instance, I quote from my Journal in the Far North in 1907. In this case, the Weasel's first motive may have been curiosity, and his action dictated by ignorance, but when the final showdown came, he displayed no lack of fighting courage.

It was on the night of Oct. 28, 1907, when we were canoeing up the Athabaska River from the Far North. The item in my Journal runs thus:

"All were sitting round the camp-fire at bedtime, when I heard a distinct patter on the leaves. 'Something coming,' I whispered. All held still, then out of the gloom came bounding a snow-white Weasel. Preble was lying on his back, with his hands clasped behind his head, and the Weasel fearlessly jumped on my colleague's broad chest, and stood peering about.

"In a flash, Preble's right elbow was down, and held the Weasel prisoner, his left hand coming to assist. Now, it is pretty well known that if you and a Weasel grab each other at the same time, the Weasel has choice of holds.

"'I have got him,' said Preble, then added feelingly, 'but he got me first. Suffering Moses! the little cuss is grinding his teeth in deeper.'

"The muffled screaming of the small demon died away as Preble's strong hand crushed out its life, but as long as there was a spark of it remaining, those desperate jaws were grinding deeper into his thumb. It seemed a remarkably long affair to us, and from time to time, as Preble let off

[51] Mamm. Catskill Mts., Proc. U. S. Nat. Mus., 1899, p. 358.

[52] Mamm. Que., Journ. Mamm., Nov., 1924, p. 253.

some fierce ejaculation, one of us would ask, 'Hello! are you two still at it?' or, 'How are you and your friend these times, Preble?'

"In a few minutes it was over, but that creature, in its fury, seemed to have inspired himself with lockjaw, for his teeth were so driven in and double-locked that I had to pry the jaws apart before the hand was free.

"The Weasel may now be seen in the American Museum, and Preble in the Agricultural Department at Washington, the latter none the worse."

References for Short-tailed Weasel

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LIFE XXXIX—THE LONG-TAILED WEASELS

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Large Weasel, Large Ermine, Long-tailed Weasel, Prairie Weasel, Yellow-bellied Weasel, New York Weasel

Mustela longicauda Bonaparte

(*L. Mustela, a* Weasel; *longicauda,* from *longus,* long; *cauda,* a tail)

Mustela longicauda Bonaparte, 1838, *Charlesworth's Mag. Nat. Hist.*, II, p. 38.

Type Locality—Carlton House, Sask.

French Canadian, *la Belette à longue queue.*
Cree, Sauteaux, and Ojibway, *Shing-gwus.*
Yankton Sioux, *He-tong-ka-shah.*
Ogallala Sioux, *He-tu-kah-san.*

This large Weasel is readily recognized by its very long tail and, in summer coat, by its rich buffy-yellow under parts, very different from the white or pale sulphur tint often seen on the under parts of other Weasels. Seen afar, in winter, it might be mistaken for a white Squirrel.

In addition to the generic characters, it has the following:

Size. Length, about 18 in. (457 mm.); tail, 6 in. (152 mm.); hind foot, 2 in. (51 mm.). ♀ about one seventh smaller.

Weight. A full-grown ♀ which died in my menagerie Sept. 23, 1911, weighed exactly 7 oz. This was taken near Chicago.

Colour. All above, pale warm yellowish brown (much like that of *cicognanii*), darkest on crown and back, lightest on legs; all below, rich, warm buffy yellow; tip of tail, for one quarter of length black; chin, cheeks, and upper lip, white. In winter, pure white, except the tail-tip, which continues black. ♀ similar.

In the Middle States, the creature seldom turns white in winter, and in the South, never. That is, only in regions where there is snow every winter, is the creature's winter coat normally white.

"In northern New York and Vermont," says Bangs, "*P. noveboracensis* always assumes a white winter coat. In northern Massachusetts, it sometimes does. I have two specimens, caught in the same trap at Wayland, Mass., one Jan. 11, 1875, in the white pelage, and the other Jan. 12, 1875, in the brown pelage. In central Connecticut, it never changes,

as shown by large series from Liberty Hill, Conn., taken all through the winter, from October to March."[1]

While the advantages of this are obvious, the exact relation of it to snowfall, is not clear. The change is more fully described in the Short-tailed Weasel Life.

Races

The following forms have been recognized:

longicauda Bonaparte, the typical form. T. l., Carlton House, Sask.

spadix Bangs, darker and more richly coloured. T. l., Fort Snelling, Minn.

oribasus Bangs, darker and duskier than *spadix*. T. l., Source of Kettle River, B. C.

arizonensis Mearns, externally like *longicauda*, but much smaller. T.l., San Francisco Forest, a few miles south of Flagstaff, Ariz.

saturata Merriam, like *arizonensis*, but larger and darker, with distinct spots at corner of mouth. T. l., Siskiyou, Jackson Co., Ore.

alleni Merriam, like *arizonensis*, but upper parts more suffused with yellow, and audital bullae flatter. T. l., Custer, Black Hills, S. D.

primulina Jackson, like *longicauda*, but brighter in colour; back darker; under parts yellow, not buff. T.l., Five miles northeast of Avilla, Jasper Co., Mo.

xanthogenys Gray, size medium, tail long; face conspicuously marked with whitish, but rest of head not black; under parts ochraceous. T. l., So. California, probably near San Diego.

munda Bangs, like *xanthogenys*, but smaller and darker. T. l., Point Reyes, Calif.

oregonensis Merriam, like *xanthogenys*, but larger and darker. T. l., Grant's Pass, Rogue River, Ore.

noveboracensis DeKay, smaller than *longicauda*, with relatively shorter, bushier tail, and less yellow below; more black on tail. T. l., southern N. Y.

peninsulae Rhoads, considerably smaller than *longicauda*, with shorter tail in proportion; between *longicauda* and *noveboracensis* in characters. T. l., Tarpon Springs, Fla.

[1] Review, p. 14.

olivacea Howell, like *peninsulae*, but more olivaceous. T. l., Autaugaville, Ala.

washingtoni Merriam, like *noveboracensis*, but with longer tail and shorter black tip. T. l., Trout Lake, Mt. Adams, Wash.

notia Bangs, like *noveboracensis*, but darker brown above, and yellow instead of white below. T. l., Weaverville, N. C.

occisor Bangs, like *noveboracensis*, but with tail long, skimpy, and with small black tip. T. l., Bucksport, Me.

The last 6 have usually been considered to form one species, *noveboracensis*. *Longicauda*, *noveboracensis*, and *arizonensis* look very different, but they seem to intergrade. Their habits are the same, and I have been careful to give the locality, if not the name, for each observation.

Range

The range of the *longicauda* is the Great Plains from the Saskatchewan to Kansas; but it has spread, as related, reaching in the east to Florida and in the west to Alaska.

Haunts and Home Range

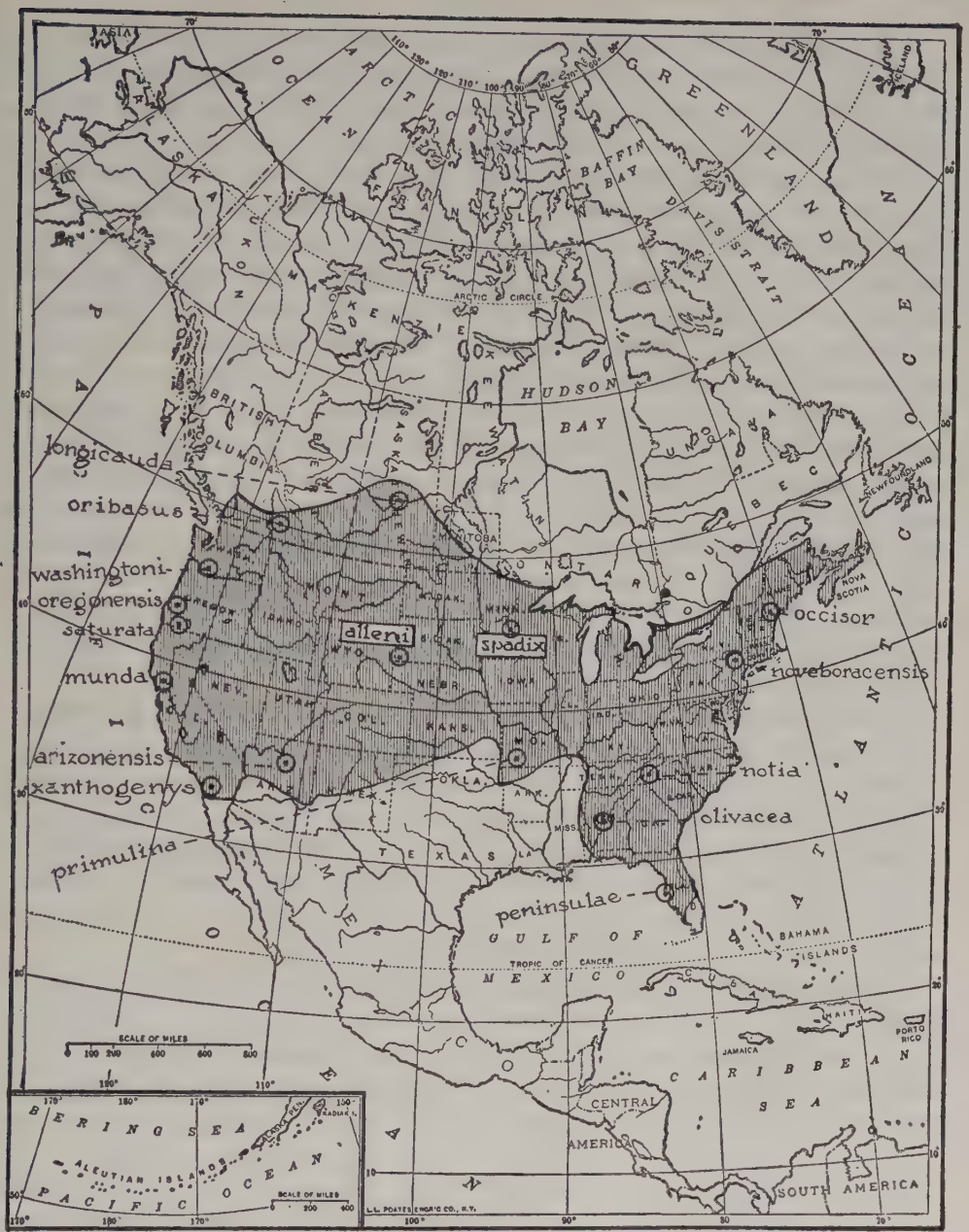
In northern Canada, I found it abundant throughout the prairie region, seeking by preference such cover as the edges of broken land, thickets, or river banks. I have seen it out on the open prairie, but not more than a mile or so from timber.

I am told, however, that it follows the Richardson Ground-squirrel wherever it goes, preying on it, and living in its burrows. As might have been expected, the ranges of these two animals coincide in the north. I never saw or heard of a specimen of *longicauda* in the forest country. It is never in a wet place, such as an extensive marsh. It is probably found throughout our Transition faunas. The mountains have peculiar races which are adapted to high altitude and rocky surroundings.

"We have ascertained that the immense number of tracks often seen in the snow in particular localities, were made by a single animal, as by capturing one, no signs of other individuals were afterwards seen. We have observed it most abundant in stony regions; in Dutchess and Ontario counties in New York, on the hills of Connecticut and Vermont, and at the foot of the Alleghanies in Pennsylvania and Virginia."[2]

The New York Weasel makes a similar choice of haunts. There is no difference except that imposed by the opportunities at hand.

[2] Q. N. A., II, pp. 61–62.



MAP XII.—RANGE OF THE LONG-TAILED WEASELS
By E. T. Seton, with assistance of the Biological Survey

W. E. Saunders, of London, Ont., says that "the New York Weasel is the form occurring there, and that it is common throughout the western part of the Ontario Peninsula. But around Wellington and Waterloo counties, the Short-tailed species begins to predominate."[3]

"Their chosen field," says J. Dewey Soper, "is the open prairie where they wander erratically from place to place, visiting wolf-willow clumps, Gopher holes, odd stones, aspen bluffs, and other irregularities which appear in their line of travel. Their life seems an endless roving in search of food, conducted without design, lacking home and apparent destination. This may be regarded as a superficial impression. Having spent many hours on their trails in the snow and cold, unravelling, as it seemed, a clue to their very lives and destiny, I have discovered the opposite to be the truth. Although their wanderings seem the most erratic and inconsistent imaginable, there is yet beneath it a species of method. I have never been able to connect positively their widely scattered trails with a fixed abode, but I have learned that they habitually return again and again over the same route. The male in particular is perhaps always detached, leading an irregular and nomadic existence. While this may be true, it is seen that a relatively fixed locality is adhered to for their hunting, and is withal, considering their size, of very considerable extent."[4]

There is little available evidence on the home range of the individual. In summer, at least, it must be small, for its food abounds everywhere. I find one note in my Journal that has some bearing on the matter:

"*Greenwich, Conn., June 1, 1920.* At Little Peequo, 10 A. M. saw a Weasel running south over the stone wall. Its tail was peculiar, the black tip very short and square, or even forked, probably the result of an accident. He came at once when I squeaked. On June 7th, at very same place, saw very same fork-tailed Weasel going same way."

In the winter, it must, of course, travel farther for its daily food. Kennicott says:

"One may sometimes be tracked in the snow through a journey of two or three miles, made in a single night. It is, however, more attached to a permanent residence than the Mink."[5]

Numbers

In the Short-tailed Weasel or Ermine Life are given statistics showing that 500,000 per annum are taken for their fur. Most of these are Short-

[3] Can. Field Nat., Sept., 1919, p. 44.

[4] Can. Field Nat., Sept., 1921, p. 109.

[5] Quads. Ill., p. 106.

tails, but the Long-tailed is among them; as commerce recognizes no difference, we cannot guess at the proportion.

Bachman, speaking for the eastern United States, says: "This species does not appear to be very abundant anywhere. We have seldom found more than two or three on any farm in the Northern or Eastern States."[6]

A pair of Long-tailed Weasels to every square mile of prairie would, I think, represent the utmost number of this species in Manitoba during primitive times. This is, however, a mere guess founded on the number of Weasel tracks in the snow. Settlement seems to have done nothing toward thinning their ranks. They are, I think, as numerous now as ever.

O. Bangs says: "Generally one species occupies a very large area, in the central part of which no others are found, so that when two species occur together, it is usually at points where the edges of their ranges overlap. It has been my experience that Weasels are nowhere very abundant—never sufficiently so to exhaust their food supply. . . . So far as I can learn, *P. longicauda* occurs in larger numbers than any of our Weasels, while *P. noveboracensis* is apparently not an abundant animal anywhere."[7]

According to the Pennsylvania Game Commission, bounties were paid on 327,441 Weasels killed in the State during the period April 15, 1915, to Dec. 31, 1922.[8]

The Biennial Report of the same Commission records bounties paid in the year ending May 31, 1923, for 50,548 Weasels; in the year ending May 31, 1924, for 44,488 Weasels; a total of 95,036.

As this destruction is not visibly reducing their numbers, we may argue a total population of Weasels in Pennsylvania, of about 250,000, practically all big Long-tails. This represents about 5 to the square mile.

Mating, Den, and Young

Few and far between are the observations on the mating of the creature. A pair which I had in my menagerie for some months, quarrelled in deadly fashion when they could. The partition between their respective cages was of $\frac{3}{4}$-inch mesh wire. But one of the wires was loose, and by forcing this to $\frac{7}{8}$-inch, the female was able to squeeze through to the male's pen. Her arrival was the signal for a tussle. They clinched and rolled over, tight locked in a deadly duel, moving so quickly that they looked like a whirring tangle of brown snakes.

For some unknown reason, neither seemed to receive any serious injury,

[6] Q. N. A., II, pp. 61–62.

[7] Review, p. 1.

[8] Seth E. Gordon, Bull. Am. Game Prot. Assn., Jan., 1923, p. 10.

and the combat was ended by the female going home through the $\frac{7}{8}$-inch hole, too small for the male to use.

These were *noveboracensis*, but doubtless the incident sheds light on the marital happiness of *longicauda*.

Writing of this species in Wisconsin, C. B. Cory says: "The young are born late in April or early in May, and usually number from 5 to 8. Mr. W. E. Snyder informs me that on May 4, 1910, while ploughing a field at Beaver Dam, Wis., a Weasel's nest was discovered which presumably belonged to this species. The nest was in a deserted burrow of a striped Prairie Squirrel (*C. tridecemlineatus*), which was about 5 feet in length and about a foot below the surface of the ground. The nest was lined with Microtus fur, and contained 8 young Weasels with eyes not yet opened, and bodies almost naked except about the shoulders, where they were covered with long hair. In the nest were 4 dead Meadowmice (*Microtus*), 1 adult and 3 young which were evidently intended as a food supply for the mother."[9]

Writing from Newburyport, Mass., S. W. Bailey says: "Several years ago, early one May, when rebuilding an old stone wall, I found a nest of the Weasels, containing 4 youngsters. They could not have been many days old, for their eyes were not open, and they were naked, except for a small tuft of fine hair or fur on the top of their heads, for all the world ludicrously like a pompadour, it seemed to me.

"The nest itself was made of dead grass, chiefly with a few tufts here and there in it of Mouse fur, the interior lining having quite a little of this—the remainder, probably, of Mice they had captured and eaten. Besides the young Weasels, there were in the nest two or three Meadowmice in a partially eaten state, together with a song sparrow and yellow warbler. Surely their larder was pretty well supplied. The nest and all would have nearly filled a peck measure.

"I called a neighbour to see them, and he took them home in his hat to show to his folks. He being a poultry raiser, I have no doubt as to their fate shortly after. The old ones he succeeded in getting a shot at a day or two later, as they stayed around in the vicinity of the nest."[10]

It is important to note that in this case, the young, like those of the Short-tail, had a pompadour; also that two parents were in attendance.

The Brave Mother

Further light is found in the following interesting note by John F. Carleton, of East Sandwich, Mass. He says: "Some years since, I was at

[9]Mamm. Ill. & Wis., p. 373.

[10]Forest & Stream, Nov. 28, 1908, p. 852.

work with my man on the edge of a dry swamp, on high land, one eighth of a mile from Bay Shore, when I found a Weasel's nest with 4 half-grown young in a brush heap. I regret that I cannot recall the composition of the nest. I sat down 'side saddle,' took up the 4 young, and placed them in the outside left breast-pocket of my coat, my man standing near.

"Soon the mother appeared, hunting for her young. I placed one on my knee; the mother soon scented it, jumped on my knee, grabbed the little one, and was off like a flash. I remained quiet, and she soon returned to my knee, worked slowly along my leg and up my coat, till she reached the pocket, pulled out another little one and dashed away with it. As I was not willing to give up the others, I did not experiment further."[11]

"The sexual difference in size," says Bangs, "is very striking in *P. noveboracensis*. The male is a large and powerful Weasel, and does not hesitate to attack and kill animals the size of the Cottontail Rabbit and the domestic hen; while the female is such a little slender creature that it seems almost incredible that she can nurse and bring up a litter of males, each of which soon grows to be much larger than herself. On June 5, 1894, some men at work on our place, at Wareham, Mass., saw three Weasels of this species cross a road and go into a stone wall. They immediately ran for a gun, and by imitating the squeaking of a Mouse, succeeded in attracting one, the adult female, out of the wall, and shot her. I saw that she had been nursing, and placed some steel traps along the wall in positions where the other two would go into them when they came back that way, as they were sure to do. The morning of June 9, I had them both. They were males, and although still retaining their milk teeth, each was very much larger than his mother."[12]

When about six weeks old, these Weasels seem to leave the nest under guidance of the mother, and roam a freebooting life for the rest of the warm weather.

On June 8, 1911, I got a glimpse of a family of 7 or 8 with the mother in a woodpile near my house.

On June 28th, of another year, at my home in Connecticut, John Crawford saw in a dry stone wall by my house an old Weasel and 5 young ones about half grown. She ran across an open space to the woodshed, where she called the young ones in a "sort of grumbling coo." Each time she did so, they popped out their heads. Crawford tried to hit them with a stick. The mother ran forward a number of times, calling the young to come, and at last dashed back into the wall where they were. As we saw

[11] Field & Stream, Jan., 1919, p. 715.

[12] Review, pp. 15–16.

no more of them, the old one doubtless went on with her band of budding pirates.

Dr. and Mrs. Howard Reid of Hamiota, Man., were favoured with an unusual glimpse of Weasel life. They tell me that while travelling four miles north of their town in the first week of July, 1912, they came suddenly on a long, thin, brown animal with a white throat. It was lying on the dusty road with 6 or 7 little young ones. "As soon as she saw us, the mother gave a shrill cry. In a flash, every little one dashed at the mother, held on to a mouthful of her fur, when she disappeared in the brush with the whole family hanging on to her." They are nearly sure it was a Long-tailed Weasel, but it may possibly have been a Mink.

This interesting family life continues throughout the summer, but apparently ends when the young attain full size. This, seemingly, is in late August or September; after that time, no one has recorded one of these family groups. In the winter the Weasel is strictly a solitary animal.

Gifts and Way of Life

Concerning its tree-climbing power, Kennicott says: "All the Weasels identified with the *Putorius noveboracensis*, which I have observed, were taken in the woods. This species is not a tree-climber any more than the Mink; but it has occasionally been seen to ascend trees, and I am informed of a remarkable instance in which one was observed to pursue and overtake a Ground-squirrel upon a tree."[13]

Doctor Mearns ascribes to it even better gifts for life in the tree-tops. He says: "It is not at all uncommon for this Weasel to take to a tree when surprised in the woods. It does not hesitate to climb the largest tree, and sometimes ascends to the top, though it more often runs out towards the extremity of one of the larger limbs, and crouches upon it until the danger is past. Several of my specimens were shot in trees. When wounded, it sometimes utters loud cries."[14]

Like all his hardy tribe, the Weasel scorns the death-sleep of Bear and Woodchuck. He lives his full, fierce life the whole year round, and takes a hunter's chance. Soper writes:

"Throughout periods of intense cold and even winter storms the Long-tailed Weasel seems to pursue activities without abatement. Many animals, though remaining active throughout the winter, are clearly more so during the lulls of fine weather. Often have I observed the suspended activity

[13]Quads. Ill., p. 107.

[14]Vert. Faun. Hudson Highlands, Bull. Am. Mus. Nat. Hist. Sept. 9, 1898, p. 349.

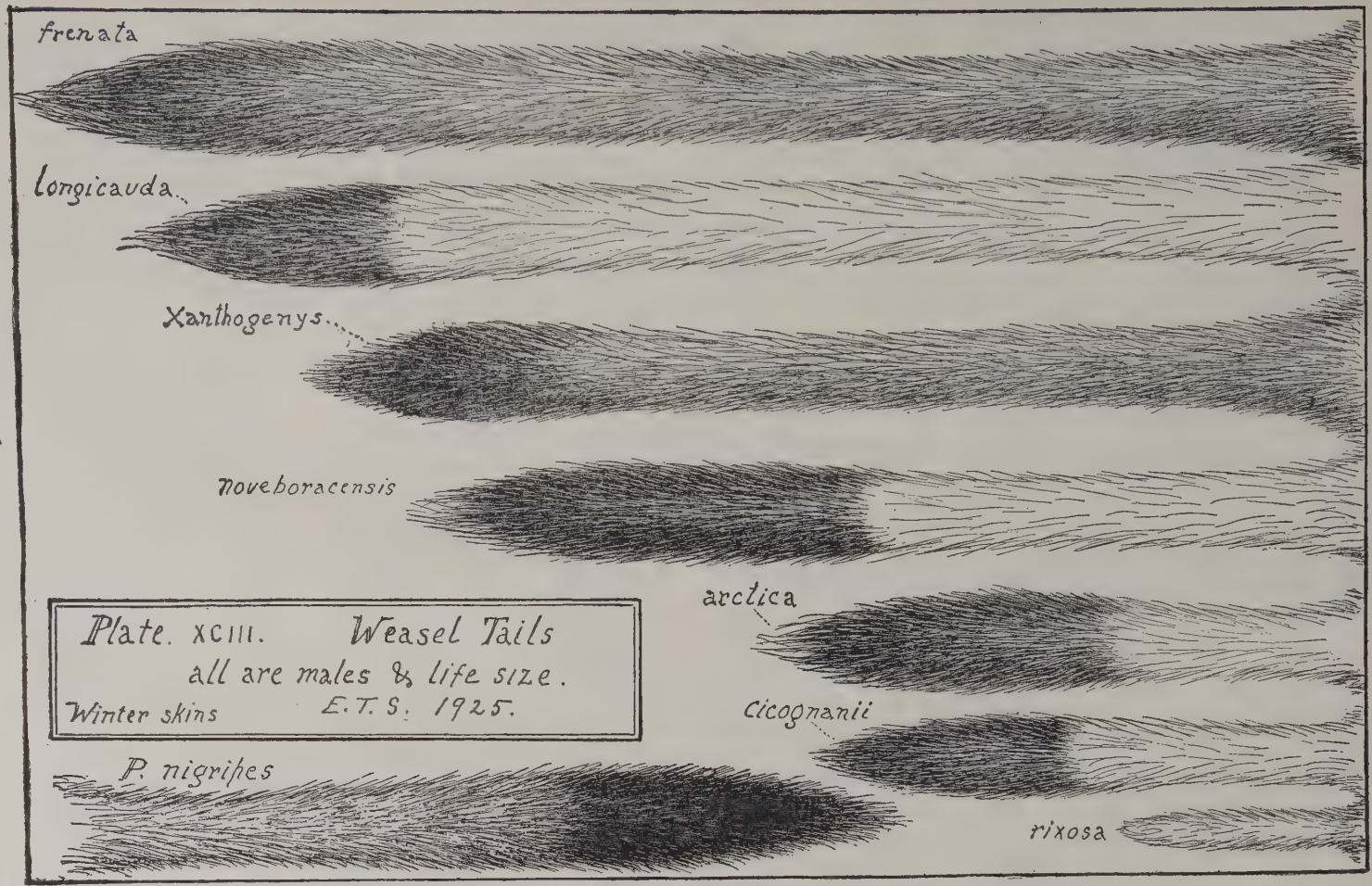


Plate. XCIII. Weasel Tails
all are males & life size.
Winter skins E. T. S. 1925.

of such as Red-squirrel and Mink, during and succeeding violent winter storms. But the Long-tail pays little heed to these. On November 5, although snow fell for the entire day before, and part of the succeeding night, the Ermine was found to have been around and about his business as usual. They doubtless travel on the coldest and stormiest nights of winter, and, in the case of the Long-tailed species, over the bleakest and most exposed ranges."[15]

In the mountains of Wyoming (1898), I watched a Long-tail, hunting in the snow around me, and in spite of heavy frost, made the accompanying sketch to illustrate his pose and tracks. His manner of diving under the snow and of coming up at unexpected and remote points was remarkable and suggested an eel in the mud.

In sociability, means of intercommunication, vocabulary, smell glands, and social economy, mating, breeding, etc., the Long-tailed Weasel appears much like the smaller Brown Weasel; but there are very few facts at hand for help in comprehending its ways of life.

"The only note we have ever heard uttered by the Ermine," says Bachman, "is a shrill, querulous cry: this was heard only when it was suddenly alarmed, or received a hurt, when its sharp scream was always attended with an emission of the offensive odour with which nature has furnished it as a means of defence."[16]

To which I may add that the growl, the snarl, the short explosive bark, the puff like a Cat spitting, and the screech of pain or battle, seem to be common to all the Weasel tribe.

The Long-tailed Weasel does not allow us to forget that his name is *Mustela* and *Mustela* is related to *Mephitis*. Merriam says: "I met one high up in Salmon River Mountains, September 5; he was in pursuit of a Richardson Squirrel in a damp, moss-covered place in a dark spruce forest, and stood bolt upright when he saw me. I wounded him with my auxiliary, and he immediately emitted his powerful stench, and disappeared in a hole at the root of a spruce."[17]

Nest of a Washington Weasel

On the West Coast, the Long-tailed Weasels show the same disposition as in the East and have habits modified only to suit the different surroundings.

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[15]Can. Field Nat., Sept., 1921, p. 109.

[16]Q. N. A., II, p. 62.

[17]N. A. F., No. 5, 1891, p. 83.

The intense local colour of these forested Alps is vivid in the account of a Washington Weasel's home, given by William T. Shaw, of the State College of Washington:

"On July 17, 1920," he says, "while setting a Biological Survey Line of traps in the flats of the Nooksack River, at Excelsior, Whatcom Co., Washington, in a thicket almost purely of salmonberry bushes, I was casually observing the Mountain Beaver burrows occurring in this locality. One burrow looked especially fresh, but unusually small. Stooping, I was surprised to see, deep down in the burrow, the head of some small creature like a Weasel. It drew back almost at once; so a wooden and a steel rat-trap, both baited with the skinned body of a small mammal, were put down.

"By evening, a large female Weasel, apparently the mother of those captured later, was taken in the steel trap. Next morning, both traps were found untouched. By evening, two nearly full-grown Weasels were taken at the same time, one in each trap. Both were males. Next morning another young male was taken in the steel trap.

"It appeared that here might be a nest, for there were some indistinct, though clearly worn, trails leading through the salmonberry bushes to the hole, with here and there a bird feather scattered about. The hole itself, 2.5 inches in diameter, was driven between the roots of the salmonberry bushes, and kept open by them. The animals had gnawed the bark from those roots adjacent to the hole, to make the entrance larger. That large blue-bottle flies were passing in and out this burrow, not only suggested the presence of a nest, but that the den might be occupied by a carnivore.

"After posing and photographing the adult female, we dug into the burrow to search, and found that it almost immediately entered a Mountain Beaver den. There, in an enlargement of one of the twisting burrows, we found a nest, about as big as a dinner plate, made of moss and resembling a grouse nest. Under this present nest, between it and the entrance, were the remains of what seemed to be a very old nest, which would suggest that this den had been used in former years and had possibly functioned also as a winter nest.

"The main den seemed to be inhabited by the Mountain Beaver as well, as fresh earth was thrown out of a burrow within a few feet of the Weasel nest.

"The exact dimensions of this nest are as follows: Diameter from surface of the ground to bottom of the nest, 18 inches; distance from top of ground to top of nest cell, 5 inches; diameter of nest cell, 13 by 14 inches; diameter of actual nest, 9 by 9 inches; dished portion of the nest, 2 inches deep;

distance dug by Weasel from Aplodontia burrow to surface of ground, 13 inches; distance from exit of' Weasel burrow to center of nest, 30 inches."[18]

Diseases

Like the Lesser Weasel, the Long-tail is scrupulously clean in person and in estate, as he understands it. That is, he keeps his sleeping quarters clean, but does not always realize that perfectly good meat can become perfectly bad if kept too long in the larder during warm weather.

Bangs, commenting on the fact that Weasels never become very numerous, as do Squirrels and some others, says:

"They are held in check by some natural cause, which may be the parasite that attacks the frontal sinuses of these animals as well as those of their relatives, the Skunks, Mink, and Otter. I have seen skulls in such fearful condition that it would seem as if the animals must soon succumb; still, there is no proof that the parasite ever does cause death. *Putorius longicauda* and *P. frenatus* are so free from its attacks that it is rare to find a skull of either badly affected. *P. noveboracensis*, on the other hand, suffers so much that it is hard to get perfect skulls, since many are so distorted that the whole interorbital region is unfit for comparison."[19]

The Weasels in my menagerie, like the Martens and Mink, showed a proneness to fits, or, as the older naturalists would have called it, epilepsy.

In 1914, I had a pair under observation for some months. Both took fits, and on Nov. 18th, the male died in one of these.

Food of the Big Ermine

There is a certain sameness in the food of all the small flesh-eaters. The chief differences are those imposed by their slightly different powers and opportunities. I doubt not that the remarks on the food of the Common Ermine would apply equally well to that of the Long-tailed Ermine.

A Cure for Ground-squirrels. On the prairies, the Ground-squirrels furnish a staple of food.

"In certain portions of the West," says Dr. G. B. Grinnell, "the Common Weasel, or Ermine, frequently takes up its abode in the villages of the Ground-squirrels, which are such a pest, and preys on the young and, perhaps, the adult Squirrels. If, for any reason, the Squirrels desert their

[18] Journ. Mamm., Aug., 1921, p. 167.

[19] Review, p. 1.

villages and move onward—as they frequently do through lack of food—the Weasels are likely to migrate with them."[20]

Professor John Macoun tells me that on July 29, 1906, at a place 20 miles southwest of Saskatoon, Sask., he saw a Richardson Ground-squirrel plunge into its hole on the approach of a Long-tailed Weasel. The latter went after it at once, but soon came out. Evidently the Squirrel had baffled it in some way; perhaps by plugging the burrow behind itself.

The most thrilling account of this Weasel in pursuit of the big Ground-squirrels, or Gophers, as they miscall them in northern Canada, is from the pen of J. Dewey Soper. In this, the Weasel attacked a Richardson Ground-squirrel, but was set on by the whole colony and driven off. The details are given in the Ground-squirrel Life, since it was their scene and triumph.

A somewhat similar experience befell a Short-tailed Weasel, as described in the previous Life.

A Killer of Red-squirrels. The amazing activity of the Weasel, aloft or afoot, is evidenced by its capturing a Red-squirrel in open chase. The two were seen by William M. Graffius of Huntingdon, Pa., in the woods near that town. He heard the pattering of their racing feet in the woods, then glimpsed the two—the fleeing Red-squirrel, with the Weasel following the trail by scent. He continues:

"On arriving at one of the large hemlock trees nearby, the Squirrel speedily ascended to nearly the topmost branch, with the Weasel closely pursuing. Then, climbing out on one of the smaller limbs, hoping thereby to prevent its pursuer from following with its weightier body, the Squirrel reached at last the very tip of the branch, and there hung suspended over the flowing stream below, a distance of thirty feet or more. But the murderous Weasel was not to be deprived of its prey in that manner. Crouching closely on the frail and narrow branch, with its long, sinuous body, it slowly and cautiously wormed its way outward to within a few inches of the quivering Squirrel. The latter, becoming frenzied beyond all bounds of self-mastery, suddenly released its hold, and plunging downward into the stream, began swimming valiantly toward the shore."[21] But the Weasel dashed down the tree to the bank and was awaiting. He sprang on the fated Red-squirrel and dragged him into the thicket, in spite of all that the man could do.

In the Slide Rock. Those of us who have seen the Cony safe in his mountain rocks may have assumed that he was immune from attack—he is so evidently safe from the violence of Bears and Wolves or the trickery

[20] Forest & Stream, Sept. 14, 1901, p. 205.

[21] Forest & Stream, Jan., 1925, p. 39.

of hawks and Foxes. But F. W. Miller, of the Denver Museum, tells me that in the Long-tailed Weasel the Calling Hare finds his chief and most dreaded enemy; for the Weasel can go where the Cony can go, and it is only a question of hunter pertinacity before the Weasel wins his prey, deep as you like in the rocks.

His Rabbits. In addition to Ground-squirrels, this species preys much on the Snowshoe-hare or Bush-rabbit, especially in winter. The Weasel actually runs it down in open chase, in spite of the Hare's superior speed. Of this I have often seen track record in the snow. Once only did I see the pursuit.

In the winter of 1886, while hunting in the poplar woods northeast of Carberry, I saw a Hare running through the brush, pursued at some distance by an Ermine or Long-tailed Weasel. The chase circled about the place where I was camped. I stopped to watch it. The Hare was at the point of giving up when, all at once, it ran toward me and took refuge under the sleigh, near my feet. The Weasel ran around at a distance but, before I could get hold of my gun, he decided to seek his dinner somewhere else.

"The Weasel preys largely upon the Gray-rabbit, pursuing it to its hole, and killing it there. Like the Mink, too, it tracks its prey by the scent, so that the Rabbit is lost if once he seek refuge in a burrow or hollow tree."[22]

A detailed account is given by B. H. Warren. He says: "I was going fishing one morning about four years ago, when I saw something going slowly across the road about 100 yards ahead of me. I ran to where I saw it, and there a Weasel was pulling a very large Rabbit through under an old log; I caught the hind legs of the Rabbit, and the Weasel pulled at the other end. I got a club and tried to kill the Weasel, but I could not hit him. Every time I would let the dead Rabbit go, the Weasel would take hold of it and begin to pull it under the log; I laid the Rabbit close to the log and held my foot on the side of log; when the Weasel put his head out and was pulling the Rabbit again, I put my foot down on top of him and killed him. The Rabbit was yet warm. I opened it and found nine young Rabbits almost large enough to make their appearance in the world, but they were all dead."[23]

A Chicken-killer. In *Forest & Stream* for Dec. 16, 1911, p. 875, Charles C. Worthington shows a photograph of a Long-tailed Weasel (*noveboracensis*), and 20 English pheasants killed by it in a single night.

Those who wish to get full details of this Weasel as a killer of game birds and poultry are referred to the long, specific, gory accounts of Bachman,

[22] Kennicott, Quads. Ill., p. 106.

[23] Enemies of Poultry, 1897, p. 431.

Kennicott, and B. H. Warren. There can be no doubt that these accounts are in the main true. Weasels did these very things, and it is the privilege of the farmer and game guardian to kill the villain when he is caught at it.

But there is another side to it, exactly as in the cattle-killing Bear. This other side is thus set forth by Frank C. Pellett of Atlantic, Iowa: "Weasels are also almost universally persecuted on account of their propensity to get into the poultry house, yet I am of the opinion that it is the exception rather than the rule for a Weasel to take to killing poultry. Their usual food is the blood of such small animals as Mice, Rabbits, and Gophers. That they sometimes kill poultry and birds, is too well known to admit of question.

. . . . . .

"My observations lead me to the conclusion that chicken-killing is not more common among Skunks and Weasels than among Cats, and that if Cats should be protected, these wild things should likewise be encouraged. If the wholesale destruction of Skunks and Weasels is justified, Cats also should be indiscriminately destroyed; for the Skunks and Weasels are more effective in destroying Mice and Rats than are Cats, and not more destructive to poultry and birds."[24]

As Mouse-hunter. "Now," says Jack Miner, "as a Field-mouse destroyer we have come to the king of them all. I have found as high as 27 adult Field-mice stored in a Weasel's winter home."[25]

Kennicott writes: "Where Rabbits are troublesome, and no fowls are kept, the presence of Minks and Weasels is desirable, especially of the Weasels, the good offices of which in the destruction of Rats and Mice, both in the field and farmyard, often save a single farmer more than the value of all the fowls destroyed for years in a large neighbourhood; yet there are few who ever willingly spare the life of a Weasel. Indeed, it is frequently killed while in the very act of hunting the far greater enemies of agriculture. . . . Whoever kills Weasels on his farm, at a distance from the poultry, might find it profitable to consider what they feed upon."[26]

Again, this same writer tells us: "Meadow-mice are certainly the greatest pests among mammals in northern Illinois; and of these the Weasel destroys great numbers. . . . I have frequently found the half-eaten remains of Meadow-mice in their own burrows, or under corn-stalks, which had doubtless been destroyed by this Weasel or perhaps the smaller one

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[24] Forest & Stream, May, 14, 1910, p. 772.

[25] Jack Miner and the Birds.

[26] Quads. Ill., p. 84.

(*Putorius cicognanii*). It is surprising that an animal so large as this should be able to force its way into the burrows of Meadow-mice; and yet it appears to do so without difficulty.

"Stacks and barnfuls of grain are often overrun with Rats and Mice; but let a Weasel take up his residence there, and soon the pests will disappear. A Weasel will, occasionally, remain for some time in a barn, feeding on these vermin, without disturbing the fowls. . . . When the animal has entered stacks or barns, it has the curious habit of collecting in a particular place the bodies of all the Rats and Mice it has slain; thus, sometimes, a pile of a hundred or more of their victims may be seen which have been killed in the course of two or three nights."[27]

The latest light on this creature's food habits, is furnished by the Criddle brothers as follows: "During the winter of 1921–22, a female Long-tailed Weasel made her home in the basement of the junior writer's house, and her bed consisted of a bag of feathers, where she evidently slept in comfort, despite the people overhead. This animal had free access to the summer kitchen, where she made herself very much at home, and helped herself to meat, milk, and such other objects as were to her fancy. She eventually became quite tame, and would readily climb up the observer's leg to take meat from his hand. Her store was never located, but her tracks showed that she often wandered more than half a mile away in search of food. About 20 ruffed grouse were frequenting the nearby woods at the time, and most of them made regular evening visits to the house for food. The Weasel, however, appeared to ignore them entirely.

"Another Long-tailed Weasel took up its residence near the farmyard during the winter of 1922–23, and made its headquarters in a threshing machine. The nest was somewhat roughly constructed and consisted of a convenient bunch of straw and chaff under the cylinder. Well to the back was a pile of approximately 3 pounds of droppings which were found to contain a considerable amount of the hair of Mice and Rabbits, but no bird remains were present. The Weasel had selected a store chamber some 140 yards away from the nest. Two Bush-rabbits had been dragged to the entrance, and numerous smaller rodents were taken below ground. The Rabbits were buried beneath the snow, and eaten as necessity arose. This Weasel had ready access to all the farm buildings, but, in spite of the presence of poultry, confined its hunting to Mice and Rats."[28]

Summary. Kennicott, after admitting the occasional destruction of poultry and game, and detailing the vast destruction of Gophers, Ground-

[27] Quads. Ill., pp. 105–06.

[28] Weasels So. Man., p. 143.

squirrels, Rats, and Mice, finishes with this remarkable sentence: "Insects are doubtless its principal food."[29]

My own impression of the creature as I saw it on the Plains is this: While Ground-squirrels in summer, and Hares in winter, may be staples of its diet, I doubt not the Long-tailed Weasel is ready to prey on any living creature it can catch, from Mouse to wild goose; and a full investigation will probably show that Mice are its most important year-round diet.

As long as farmers farm, they will doubtless consider it a solemn duty to kill a Weasel at sight; and this is one of the duties they never wilfully dodge. We cannot blame them if we read of the destruction a Brown Weasel can do in a hennery; and, remember, the Long-tailed Weasel is a Brown Weasel multiplied two diameters in weight. It is well, however, to recall, first, the havoc the species makes among Mice and Ground-squirrels. Second, *certain individuals only* go a-henning; others, of a different mood, are content to go a-mousing and a-squirreling all their lives; and these we do not need to destroy. That is, kill only those that *come to be killed* in the barnyard.

Strange Incidents in Weasel Life

One of the earliest known attempts at conservation was put in practice by good old Dr. John Bachman, who thus describes the effort he made with the help of the Long-tailed Weasel:

"Whilst residing in the State of New York, many years ago, we were desirous of preserving a number of Rabbits during the winter from the excessive cold, and from the hands of the hunters, who killed so many that we feared the race would be extirpated in our neighbourhood; our design being to set them at liberty in the spring."

Having in confinement specimens of both the common Weasels, he tried them as Ferrets. The little one, *cicognanii*, seemed frightened, and was useless; but the Long-tailed accepted the job, and acted with such vigour that 12 Rabbits were secured in one morning, and more than 50 in four weeks.[30]

On June 14, 1915, as I prowled around the south side of the lake on my homeland at Greenwich, Conn., my attention was called to a pair of song sparrows and a male towhee that were noisily mobbing a Weasel, twittering around and darting at him, as though they knew full well his evil ways. The Weasel paid little heed, but soon dived from sight in a stone wall.

In my small menagerie, I have had half-a-dozen Weasels of the New

[29]Quads. Ill., p. 106.

[30]Q. N. A., I, pp. 177–78.

York species. Their sleeping dens are arranged so as to be easily and silently opened. Several times I have lifted the lid to find the Weasel in a deep sleep—a sleep so profound that I had to poke him vigorously with a stick before he awoke, looked up, and rushed forth with a little puff of wrath, and a little puff of smell. It is not easy, but one may catch a Weasel asleep.

The following is supplied by the Criddle brothers: "On one occasion, the senior writer saw a Long-tailed Weasel resting on a tree. It had squeezed its abdomen between a forked limb, and was hanging thus, in evident pain. On being approached very closely, it showed some inclination to fight, but changed its mind and moved instead to another limb, where it again squeezed its body between two branches. There was a most pathetic look upon the animal's face, almost as if it were requesting assistance. We have no doubt that it had eaten part of a poisoned Mouse or Gopher."[31]

In *Country Life* (English), March 18, 1922, p. 397, is a picture of a Stoat that had no fore legs. Evidently it travelled on its hind legs. Whether it was born that way, or lost them through accident, does not appear. It was shot near Hopetown, Haw, Scotland, and is reported by James Ritchie, of the Royal Scottish Museum, Edinburgh.

Most observers have attributed to the Weasel a courage and audacity that is unexcelled. In the following, by Charles Tatham, Jr., of Cambridge, Mass., we may discover the maximum of courage with the minimum of discretion. It was at his summer home in Westchester County, New York, that the incident took place.

"Bordering the road that ran by our house," he says, "was a long wooden fence with upright slats about three inches apart. I was standing by this fence, one drowsy August morning, and with me was a friendly yellow mongrel. I was waiting for the postman, and the Dog was aimlessly sniffing around in the grass. Suddenly I heard a yelp, and looked around just in time to see a Weasel slip through the fence, while the baffled Dog barked excitedly on this side. The Weasel knew it was out of reach, and seemed in no hurry to leave. Instead, it suddenly darted again through the fence, and jumped at the Dog's face. This surprised animal drew back his head with a yelp, then bumped his nose against the fence, as the Weasel again slipped through to safety. The little beast seemed in no way inclined to seek safety in flight, which it could perfectly well have done. Once more it darted through the fence. But this time the Dog was ready for it, and as it sprang, caught it in his jaws. One crunch, and all was over.

"The whole scene only lasted a couple of minutes, and during it, I

[31] Can. Field Nat., Sept., 1925, p. 147.

stood perfectly still. I don't know who was the more astonished, I or the Dog! Was the Weasel mad, or did it think it could lick a Dog almost as big as a collie?"[32]

J. Dewey Soper recounts a strange adventure of a Weasel with a hawk. He says: "I recall a story told me years ago, by a farmer, which portrays nicely the intrepid nature of this animal. While working in the fields, he heard high overhead the strident calls of a hawk. Their unusual quality attracted his attention, as well as the peculiarity of the actions accompanying them. Watching, he noticed the bird pass through some unusual gyrations, steady itself a moment, and then come pitching to the earth, tumbling and turning. The man ran rapidly to the spot where the hawk fell, and was just in time to see a Brown Weasel leap from the feathers, and disappear in the nearby fence. From some concealed position, it had doubtless leaped upon the feeding hawk, and being lighter, was instantly borne high into the air. In bulldog fashion, once having a grip, it continued to work deeper until a fatal spot was reached."[33]

The following occurrence that I witnessed in 1897 is good evidence of the ferocity and courage of this animal: On Sept. 5th, I was out near Medora, N. Dak., on Roosevelt's old ranch, with several men on a Wolf hunt. At night, as we were about to roll up in our blankets, a member of the party called out: "Say, Jack, there's a Pack-rat just run under your saddle." As a Pack-rat (*Neotoma*) is a notorious mischief-maker among leathers, Jack went over and gave the saddle a kick. Then we heard him gasping, swearing, and finally shouting for help. In the dim light, we could see him dancing like a maniac, and clutching at his throat. The campers all sat up and answered his calls for help, with jeers and derision. "Look at Jack; he's got 'em again. Kill them, Jack; the air's full of them," etc.

A white bull terrier with us, now rushed forth growling, and seemed also to leap at the man's throat, then to shake himself. Now the man grew calm, and we learned that he had kicked out, not a Pack-rat, but a Long-tailed Weasel, which immediately had attacked him. It had run up his legs a number of times, aiming at his throat. He had clutched it and cast it off again and again, but it had persisted, and might have done him serious injury, but for the prompt assistance of the bull terrier.

References for Long-tailed Weasels

1849—Quadrupeds of North America, by Audubon & Bachman, II.
1858—Quadrupeds of Illinois, by Kennicott.

[32]Forest & Stream, April, 1925, p. 224.

[33]Can. Field Nat., Sept., 1919, p. 45.

1896—Synopsis of the Weasels of North America, by C. Hart Merriam. N. A. Fauna, No. 11.

1896—Review of the Weasels of Eastern North America, by O. Bangs. Proc. Biol. Soc. Wash., Feb.

1925—Weasels of Southern Manitoba, by Norman and Stuart Criddle, *Canadian Field Naturalist*, September.

LIFE XL—LEAST WEASEL

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The Least Weasel, or Mouse-Hunter

Mustela rixosa (Bangs)

(L. *Mustela*, see ante; *rixosa*, quarrelsome, or aggressive; though in this respect, the species does not seem to be any worse than its betters)

Putorius rixosus Bangs, 1896, Proc. Biol. Soc. Wash., X, pp. 21-22.
Mustela rixosa Thomas, 1911, Proc. Zool. Soc. London, March, p. 168.

Type Locality—Osler, Saskatchewan, Canada.

French Canadian, *la petite Belette.*
Cree, Ojibway, and Sauteaux, *Shing-gwus-ance* or Little Weasel, diminutive of *Shing-gwus*, the Weasel. This name is applied to all of the small Weasels indiscriminately.
Chipewyan, *Tel-ky'-lay-az-zy* (little Weasel).
Yankton Sioux, *Ke-tong-ka-ska* (given to all small Weasels).

This species has been partly known to naturalists since 1857, when Baird described a specimen, believing it to be the same as its larger cousin, the Least Weasel, of Great Britain. In 1893, W. C. Colt, at Osler, Sask., captured a summer specimen which he sent to Outram Bangs, of Boston. In 1896, this naturalist, convinced that it represented an undescribed species, gave it the name *rixosa*. It proves to be very different from its European cousin in size, as well as in colour and cranial characters. It is considerably smaller, and is, indeed, the smallest known beast of prey in the world—smaller than a good-sized Meadow-mouse. Although it is well to remember, however, that still smaller races of this same species have been found in Japan and in Siberia.[1]

It is readily recognized by its very small size, and short tail without black tip, combined with the generic characters of *Mustela*.

Size. Head and body, about 6 in. long (150 mm.); tail, $1\frac{1}{4}$ in. (31 mm.); hind foot, about $\frac{18}{16}$ in. (20 mm.).

A ♀ which I got at Old Fort Reliance, Great Slave Lake, Sept. 15, 1907 (No. 1090, Seton Coll.), was: total length, $6\frac{7}{8}$ in. (175 mm.); tail, $1\frac{8}{16}$ in. (30 mm.); hind foot, $\frac{18}{16}$ in. (20 mm.). The body, after skinning, was $\frac{3}{4}$ in. (19 mm.) through the deepest part, and but $\frac{1}{2}$ in. (13 mm.) through the chest.

[1] Journ. Mamm., Nov., 1921, p. 209.

Colour. In summer coat, upper parts and tail, even umber brown; under parts, pure white without any yellow tinge, and sharply demarked from the brown; or, in detail, lips, cheeks, chin, throat, fore neck, chest, belly, inside of each leg, and the toes, white.

Races

Four forms have been recognized:

rixosa Bangs, the typical form. T. l., Osler, Sask.

eskimo Stone, a larger, redder race with shorter tail. T. l., Point Barrow, Alaska.

allegheniensis Rhoads, larger, darker, and more thinly furred than *rixosa*. T. l., near Beallsville, Washington Co., Pa.

campestris Jackson, like *rixosa*, but paler, with larger white areas; skull, narrow. T. l., Beemer, Cuming Co., Neb.

Range

This species is found in Arctic and boreal America, from the Bering Sea, at least to Hudson Bay, probably to the Atlantic; and from the Arctic Ocean to the southern limits of the Canadian Fauna.

Prof. S. F. Baird had a specimen from Pembina, Minn.[2] Outram Bangs records it from Osler, Sask., Alaska, Moose Factory, and Fort Albany.[3] According to Kennicott, it is found in Indiana and northern Illinois, and in fact, from New York westward.[4] G. F. Dippie showed me a specimen at Calgary, where he says it is common. J. M. Macoun found it at Jasper House. E. A. Preble took specimens in 1901 at Fort Smith and Fort Resolution.[5] E. A. Preble and I secured one at Old Fort Reliance, Great Slave Lake, Sept. 15, 1907; and W. H. Osgood got one at Tyonek, Cook Inlet, Alaska.[6] In Pennsylvania, S. N. Rhoads recently discovered and described a small Weasel (*allegheniensis*) that may turn out to be a race of *rixosa*.[7] In the American Museum, New York, is a specimen taken at Johnstown, Ohio, by N. G. Buxton, Jan. 25, 1907.

A winter specimen was sent me from Woonona, Man., by W. G. Tweeddell. Two brown-coated specimens in my collection were taken near Morden by D. Nicholson in November, 1903. He has seen several in the

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[2] Pac. R. R. Rep., VIII, 1857, p. 160.

[3] Review of Weasels, Biol. Soc. Wash., 1896, p. 22.

[4] Quads. Ill., 1859, p. 245.

[5] N. A. F., 27, 1908, p. 234.

[6] N. A. F., 21, 1901, pp. 69-70.

[7] Mamm. Pa. & N. J., 1903, pp. 173–76.

region of Pembina Mountain. I have about a dozen records from Winnipeg. Dr. Gordon Bell shot one near Delta Lake, Man., Sept. 15, 1902, and J. S. Charleson says it is quite common in fall about Macdonald, Man.

J. Dewey Soper got one at Edmonton, Alta., as noted later. J. Hole, the fur-trader, says that in March, 1899, he saw one at Fort Resolution. It was no bigger than a Mouse, was snow-white everywhere, and had no black whatever on its tail. This was the first he ever saw. It was living under a store.

Although the Least Weasel has a wide extension in countries that have long been studied by naturalists, it is so elusive and hard to observe, that until recently it has escaped our acquaintance, and as yet we have practically no knowledge of its habits. The specimen from which I made the drawing was taken at Morden, Man., about November, 1903, by D. Nicholson, and is still in full summer coat.

Food

Nicholson had several brought him at different times, but said that they "went bad" so quickly that most were lost. When a small animal turns putrid in two or three hours after death, it usually means that *its food is insects*.

This proneness to spoil, therefore, gives us the first ray of light we have on its mode of life. I have also known it to feed on Mice, and, doubtless, it adds small birds to its list.

E. Wilson tells me that, at Winnipeg, Arthur Hutchings caught a Least Weasel in a mouse-trap about April 15, 1907. It was no larger than a Field-mouse, and pure white. The trap had broken its leg. He nursed it till it was well, and then set it free. It now lives about his woodshed, and is remarkably tame.

My Fort Reliance specimen had come upon one of our mouse-traps in which was a dead Mouse, had eaten the head, and then dragged the trap and Mouse some 20 feet, where itself was killed by another mouse-trap. As its stomach was quite empty, I think there may have been two Weasels there.

The following incident, witnessed by my friend, George L. Fordyce, of Youngstown, Ohio, furnishes additional light on the food habits of this pigmy:

"While out in the field this morning (Dec. 26), walking along the bank of a ravine at the edge of our golf course, I saw a Field-mouse run out of the bushes into the rough grass that is just outside of the fair-green of the

course. In another instant, what I thought at first to be a white Mouse came out at the same place. The Mouse ran into a wheel track, and disappeared under the grass, coming out about 6 feet from where it went in. The white animal followed through the same course, and when it came out, I saw that it was a small Weasel, very little larger than the Mouse, and that it was following the trail of the Mouse by scent.

"For a time, the Mouse ran in circles, and zigzagged about, often coming around within 4 or 5 feet of the Weasel; but the latter seemed so intent on the trail, that it did not notice the Mouse to one side. After a time, the latter started toward the open golf course; and when the Weasel reached the point where the trail was straight, it sighted the prey, made a sudden dash forward, and, although 25 feet behind, overtook the Mouse while it was going 3 or 4 feet.

"For a few seconds, they seemed to fight, until the Weasel got the Mouse by the throat, and started for the bushes, dragging the body. When it came to within about three feet of me, I moved a little to see what it would do. It dropped its victim, and ran into the ravine. The Mouse had a drop of bright red blood in the centre of its white throat. I waited near by for 15 or 20 minutes, thinking the Weasel might come back, but it did not show up again; even an hour later, the Mouse had not been disturbed."[8]

Thus, all the information at hand indicates that this diminutive species feeds chiefly on insects and Mice; so that it must be considered a friend of the farmer, an animal, therefore, that is worthy of full protection.

Says J. Dewey Soper: "The only place I ever came into contact with the Least Weasel, is Edmonton, Alta., and even there, where Weasels are common, only one was taken within a certain period of time, during which about 150 of the other species were captured. This fact indicates its rarity in that region.

"I found it about Nov. 13 in one of my traps, along the White-mud River, a few miles southwest of the city. It was pure white, proving it takes on its winter pelage as soon as the other species.

"The locality in which it was collected was that ordinarily frequented by *M. cicognanii* and *M. longicauda*—meadow-like river tracts sparsely overgrown with poplar. The first sight of its body made me think of an albino Meadow-mouse."[9]

One of the best accounts we have of this animal's food habits is by the Criddle brothers, who say:

[8] Personal letter, Dec. 26, 1907.

[9] Can. Field Nat., Sept., 1919, p. 43.

"The Least Weasel, or, as it might well be termed, the Mouse-Weasel, is such a midget in comparison with the other species that it usually passes unnoticed unless caught in a trap. It is quite incapable of killing poultry, but, being small, it can readily follow Mice down their holes or along their runways. It probably kills some nestling birds, and perhaps extends its bill of fare to insects. The following is taken from the manuscript of an article by the junior writer on *Microtus minor:*

"'In 1922, these Mice went into winter quarters in great numbers, and their homes were well stocked with food. Three homes were under observation, in which all went well until the middle of February, 1923. Then, within a few days, each was taken possession of by a Least Weasel and the inhabitants quickly destroyed. One Mouse residence near my house was occupied by a Weasel for about 2 weeks, during which time I observed where several Mice had been carried over the snow to the home. This Mouse residence was examined in April, and in it were discovered 6 dead *Microtus minor*, 1 *Evotomys*, the head of another, and at least 6 or 8 other remnants including *Microtus drummondi*, these last remains being chiefly indicated by the hair-lined nest of the Weasel.

"'The homes of 27 other Mouse communities were examined at this time, and all were found to have been entered by Weasels, the Mice having been killed and partly eaten in each instance. Thus, from being an abundant animal, this species was reduced to insignificance in the course of a few weeks, while all other kinds of Mice had suffered severely from the same enemy.'"[10]

Dr. W. H. Osgood, while collecting in Cook's Inlet, Alaska, secured an example, of which he says: "One adult female was taken in a swampy place near Tyonek, Sept. 19. It was caught in a small mouse-trap in a *Microtus* runway, and doubtless would have escaped, had it not thrashed into a pool of water and drowned."[11]

Indian Superstition

"The natives," he adds, "regard the capture of one of these rare animals as a piece of great good fortune. One old Indian who frequently visited our cabin, told us that his brother, who had caught one, when a small boy, had in consequence become a 'big chief'; and he assured me that since I had caught one, I must surely be destined to become a man of great wealth and power."

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[10] Weasels of Southern Manitoba, by Norman and Stuart Criddle, Can. Field Nat., Sept., 1925, p. 145

[11] N. A. F., 21, 1901, pp. 69–70.

His Way of Life

The Criddles make the following appraisal of this tiny creature: "One at least of our Weasels is almost wholly beneficial, and we have no hesitation in proclaiming this species, *rixosa*, the most useful of all Canadian predators."[12]

These brief notes are all that is on record about this widespread but furtive species.

Direct observation fails us here, and for further light we must look to the next best thing—the analogy of its kindred.

The nearest well-known relative of our tiny carnivore, is the Little Weasel or Mouse-hunter (*P. nivalis*) of Great Britain. This differs chiefly in being slightly larger; and there is no reason to doubt that in habits, as in anatomy, they are very similar.

According to Thomas Bell,[13] the Little Weasel in Great Britain preys chiefly on Mice; for which reason he regards it as an animal to be encouraged about barns. But it also devours insects, small birds, and, on rare occasions, chickens. It hunts by scent, climbs, and swims with ease.

Gestation in the Weasels is about 42 days. The young are usually 5 in a litter, but vary from 4 to 6. The nest is in a hole in a bank. It is lined with grass and herbage. The mother will defend her young fearlessly and desperately against all assailants.

Most Weasels are solitary hunters, but the mother will go hunting with her whole brood in late summer and early autumn. These family gatherings are, doubtless, the "Weasel packs" one occasionally hears of.

J. G. Millais points out[14] that in parts of England, the Common Weasel (*P. nivalis* Linn.) is called "fairy," and states that "the habit of Weasels to travel and hunt in company at night most likely explains a superstition which still lingers in the West of England, to the effect that Hares are hunted at night by packs of little fairy hounds, locally called 'Dandy Dogs'; and these, some of the country people will assure you, they have seen and watched with awe."

It is well known that "Vair" is old French for a kind of fur, usually explained as Weasel or Ermine. From this, we get the adjective "vairy," which, changed into "fairy," persists as a local Weasel name in England. It is further believed that Cinderella wore slippers of *vaire* (ermine), not *verre* (glass) in the original telling.

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[12] Weasels of Southern Manitoba, by Norman and Stuart Criddle, Can. Field Nat., Sept., 1925, pp. 174–48.

[13] British Quads., 1874, pp. 183, et seq.

[14] Mamm. Gt. Br. & Ire., II, 1905, p. 135.

LIFE XLI—THE SEA-OTTER

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Sea-otter, Sea-beaver, or Kalan

Enhydra lutris (Linnæus)

(Gr. *Enhydris*, an Otter, from *enhydros*, living in the water; L. *lutris*, from *Lutra*, an Otter)

Mustela lutris Linnæus, 1785, Syst. Nat., ed. 10, I, p. 45.
Enhydra lutris Gray, 1843, List Spec. Mamm. Brit. Mus., p. 72.

Type Locality—Kamchatka.

Russian, *Bobry morski* or *Sea-beaver.*
French, *Loutre marine.*
Eskimo, *A-mi-kuk.*

The genus *Enhydra* Fleming, 1822, belongs to the family *Mustelidae* or Weasels. It includes large seal-like animals, really Otters adapted for marine life. Skull as in *Lutra*, but with only 4 incisors in lower jaw; molars, massive with rounded cusps; mammae, 2, ventral; hind feet, large, flat, and flipper-like; fore paws, like those of the common Otter; tail, short.

$$\text{Teeth. Inc. } \frac{3-3}{2-2}\text{; can. } \frac{1-1}{1-1}\text{; prem. } \frac{3-3}{3-3}\text{; mol. } \frac{1-1}{2-2} = 32$$

With these generic characters, the Sea-otter combines the following:

Size. Total length, $3\frac{1}{2}$ to 4 ft. (1,060 to 1,220 mm.); tail, about 12 in. (305 mm.); hind foot, about 6 in. (150 mm.); width of hind foot, about 4 in. (102 mm).

Colour. General colour, deep, glossy, brownish black, frosted with white-tipped hairs; head and neck, grayish white or yellowish white, especially in the young; top of head, dark brown.

Sexes alike in colour, etc., but the ♀ a little smaller, and of finer fur.

Races

Two races have been recognized:

lutris Linnæus, the typical form. T. l., Kamchatka.

nereis Merriam, seems to be larger than the foregoing; the type was 6 ft. long in the flesh, but skull characters only are given. T. l., San Miguel Island, Calif.

History and Ancient Numbers

It is not generally known that Padre Taraval, not Steller, was the first white man to see and write about the famous Sea-otter of the Pacific. The historian, Venegas, quotes Taraval's account of the Sea-otters, which were abundant on Cedros Island, Lower California, at the time of his visit in 1737. He describes the ease with which they were killed by the Indians.[1]

"Under Spanish rule, Sea-otter hunting and trading in their domain by foreign ships, was prohibited, but many thousands of skins were traded for by smuggling and hunting vessels, along the Pacific coast, early in the last century. One ship alone secured 1,700 Sea-otter skins from the natives during a single visit to Ensenada in 1809."[2]

It will be seen, however, that, although Taraval preceded Steller by four years in his discovery, his account was not given out till 1757, that is, six years after that of Steller had been published.

In 1741, when the intrepid and ill-fated Vitus Bering and his unfortunate followers landed on Bering Island, of the Commander group, they found the Sea-otters in bands on the beaches, or gambolling among the kelp and heavy swell of those rugged coasts. "They covered the shore in great droves; and as the animal is not migratory, but is born and bred there, they are so far from fearing man, that they would come up to our fires, and would not be driven away until, after many of them had been slain, they learned to know us and run away. Nevertheless, we killed upward of 800 of them and if the narrow limits of the craft we constructed had permitted, we should have killed three times as many."[3]

On their return to Kamchatka the following year (1742), these sailors, reduced by hardship from 78 to 44, brought with them more than 700 skins of this costly fur; and the news was spread of the Sea-otter's haunts and numbers. Then followed a period of reckless slaughter by the rapacious Russian hunters.[4]

Dr. G. W. Steller had been a member of the Bering Expedition. When the commander died, Steller, being an ardent naturalist, found time to collect material and write his famous "De Bestiis Marinis." In this, he described, for the first time, the gigantic Sea-cow, or Rhytina, now extinct; the Sea-lion, another monster; the Fur-seal, now famous in commerce;

[1] Noticia de la Calif., II, p. 438, 1757.

[2] Suppl. App., p. 42, in Browne's Resources of the Pacific Slope, 1887; quoted in Nelson's Lower California, 1921, p. 111.

[3] De Best, Mar., p. 215.

[4] Stejneger, 1898, p. 29.

and the Sea-otter, to be saved from extinction to-day only by organized national effort.

It was Steller's description of the Sea-otter that furnished Linnæus with the basis for his formal naming of the species as *Mustela lutris;* for the father of scientific classification in natural history perceived promptly the kinship of the Sea-otter with the Weasels.

The next important occasion when the species appeared in history was when, on his famous voyage, Capt. James Cook met with the creature in 1777, and the following year gave a description of it in his narrative.

From this time, accounts of the Sea-otter were frequently published; and travellers traced it across to America, and down the west coast, commenting on the wonders of its fur, and its abundance; for it was oftentimes seen in bands numbering from 50 up to hundreds.[5]

Even so recently as 1880 to 1890, Littlejohn writes: "In the early days of my hunting on the Japan coast, we found the Otters in their primitive state, because they had never been hunted at sea. There we found them in 'schools,' and as many as 400 were sometimes seen in one."[6]

The Great Slaughter on the Asiatic Shores

The Sea-otter had for ages been a staple provider of fur and flesh for the natives of the northern Pacific coasts and islands. On the very day, in 1741, when Bering and his crew set eyes on its shining black velvet bands, gambolling and far-roving on the stormy Northern sea, thanks to the civilization that he heralded, the extermination of this wonderful creature began.

When the survivors of that ill-fated expedition returned to Kamchatka in 1742, as already related, they took with them 700 skins of the Sea-otter. Even in those days, the fur was precious; and among the traders, there was something like a rush for the Otter grounds. Then began the great slaughter on the Asiatic shores. The pursuers were so greedy, and the Otters so easily taken at first, that the shameful work was finished in a quarter the time it took us to extirpate the Buffalo.

Bering Island bands were the first attacked, and here "in 1745, Bassof and Trapeznikof secured 1,600 skins; in 1748, about 1,350 were killed. The result was that, within a very few years, the Sea-otter almost disappeared from Bering Island, for Tolstykh's expedition obtained only 47 during the winter of 1749–50; Drushinin's men, in 1754–55, took only 5; while in the account of Tolstykh's second expedition, winter of 1756–57,

[5]Scammon.

[6]P. 81.

it is expressly said that 'no Sea-otters showed themselves that year.' It is interesting to note that, even in those days, Copper Island offered a safer retreat for the Sea-otter, since Yugof, who also visited that island, returned home in 1754 with 790 skins.

"While not actually and literally exterminated on Bering Island—Trapeznikof's expedition of 1762–63 secured 20 Otters there—it did not become common there again, except possibly during an alleged sudden reappearance in 1772, until after the abandonment of the island, when the Russian-American company was organized. Upon the re-colonization of the island, the Otters were found common in places; thus, it is said that in 1827, no less than 200 Otters were killed in one week at the Reef near the present Nikolski village.[7] But the reckless slaughter of former days was resumed, and the Sea-otter long ago ceased to be a regular inhabitant of that island. Occasionally, a solitary individual strays over from Copper Island," where a small herd exists under careful legal protection and management.[8]

The Copper Island Band

Realizing that the Sea-otter must be protected and managed, or it would disappear together with the revenue it yielded, the Russian authorities took a very proper attitude. They put an end to all indiscriminate slaughter, and enacted laws to care for the remnant that still found a congenial home on Copper Island; with the result that they have "succeeded in preserving and increasing the Sea-otter to such an extent that I believe there is no other place in the world where so many Sea-otters can be seen at the present day [1897]. The condition of the herd is now such that 200 animals can be killed off yearly without detriment. The places where the Sea-otters have their rookeries are constantly guarded to keep intruders off. Shooting, making fire, or smoking, is strictly prohibited near these places. Only nets are now used to capture the Otters, and if any females or yearlings are caught alive, they must be set free. The number to be taken is determined in advance by the administration, and the hunting expeditions of the natives are undertaken in common, under the leadership of the chief; though each hunter keeps the Otter he secures. They are taken off their hands by the Russian Government at a certain fixed price."[9]

Thus the Otters are conserved; 249 natives are assured a living; the

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[7] Slunin, Promysl. Kamch. Sakh. Komand. Ostr., 1895, p. 103.

[8] Stejneger, p. 29.

[9] Stejneger, pp. 29–30.

world's markets still have a dribble of the much-prized skins; and the Government itself makes a comfortable clear annuity out of the plan.

"Recently," says Townsend, in November, 1915, "the catch of Sea-otters from the Kurile Islands stretching southward from Kamchatka, has been compiled from official Japanese records by Captain Snow of Yokohama, for many years engaged in Sea-otter hunting. His figures place the total number of skins marketed from 1872 to 1909 at 12,453. [That is, an average of 336 per annum.]

. . . . . .

"In Asiatic waters (exclusive of the Commander Islands, where the Otter has been partially protected) the catch ranged from 1,000 to 1,500 a year."[10]

Discovery of the Otter Islands of America

The great slaughter of the Sea-otters began on the Russian side of the Pacific, but the adventurous and rapacious hunters were driven ever farther by the completion of this havoc, in search of those wonderful sea-robes; till, one by one, they discovered and exploited the Aleutian Islands and the Bering Sea. Thus, the Sea-otter was to the Alaskan coasts what the Beaver was to Canada—the immediate prize that ever lured on the hardy and enterprising; the creature whose robe was the most tangible promise of wealth held out by the new and unknown waste.

Thus, the islands were sought out; for each and all of them in that region were headquarters for a swarming band of gambolsome Sea-otters—thousands and tens of thousands there were.

In less degree, all the myriad islands of the north Pacific, swarmed with these wonderful children of the kelp and the surf.

Hitherto, the natives had taken but small toll of the Sea-otter. It was only one of several abundant robe-providers. Their needs were simple, their numbers were few.

The Otters abounded, but were lightly esteemed, for the Hair-seal and the Sea-lion offered flesh more palatable, and robes more serviceable to these northern hunters. And when the traders found a copper-coloured Aleut wearing a rich robe of Otter skins, it was easy to buy it from him for some trifle.

But soon the competitive bidding of rival greedy traders worked a change. The natives learned that one Otter skin was worth a score of other pelts, and they set about collecting them with new vigour and destructiveness. Thus the epoch of extermination on the American side was

[10] P. 1286

begun. "During the first few years, the numbers of these animals taken all along the Aleutian Chain, and down the whole northwest coast as far as Oregon, were very great; and compared with what are now captured, seem perfectly fabulous. For instance, when the Prybilov Islands were first discovered [1785], two sailors, Lukannon and Kaiekov, killed at St. Paul's Island, in the first year of occupation, 5,000. The next year they got less than 1,000, and in 6 years after, not a single Sea-otter appeared; and none have appeared since."[11] That same year of abundance, 1786, according to Beechey, 50,000 Otter skins were collected.[12]

Otter Island, close to St. Paul, still reminds us by its name of the primitive number of these animals. On St. George, the other big island of the Pribilofs, they were equally abundant. "They rapidly declined in numbers, and according to Veniaminoff, had become scarce by 1811, and extinct within the next 30 years."[13]

Thus, one by one, their favourite haunts and final refuges were ferreted out, and the same ghastly slaughter was repeated.

"When Shellikov's party first visited Cook's Inlet, they secured 3,000; during the second year, 2,000; in the third, only 800; the season following, they obtained 600; and finally in 1812, less than 100; and since then not a tenth of that number. The first visit made by the Russians to the Gulf of Yahkutat, in 1794, 2,000 Sea-otters were taken, but they diminished so rapidly that in 1799, less than 300 were taken. In 1798, a large party of Russians and Aleuts captured in Sitka Sound and neighbourhood 1,200 skins, besides those for which they traded with the natives there, fully as many more; and in the spring of 1800, a few American and English vessels came into Sitka Sound, anchored off the small Russian settlement there, and traded with the natives for over 2,000 skins, getting the trade of the Indians by giving fire-arms and powder, ball, etc., which the Russians did not dare to do, living then, as they were, in the country. In one of the early years of the Russian-American Company, 1804, Baranov went to the Okotsk from Alaska with 15,000 Sea-otter skins, that were worth as much then as they are now, viz., fully $1,000,000."[14]

Langsdorff, on his voyage (1803–07), has much to say about the Sea-otters of the Northwest coast, showing the importance of the trade. He speaks of a Boston ship arranging for a "cargo of Sea-otters. . . .

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[11] Elliott, p. 54.

[12] Narr., 1831, II, p. 403.

[13] Preble, 1915, p. 130.

[14] Elliott, pp. 54–55.

[In San Francisco Harbor][15] we saw a great many Sea-otters."[16] "The channel which we followed to get into the [San Francisco] Bay, was full of Sea-otters and Sea-dogs. . . . Three Sea-otters, however, who lay sleeping almost close to our boat, presented a temptation not to be resisted, and these we did kill and carry away with us."

As he journeyed along the coast of California, he wrote: "Sea-dogs and Sea-otters are taken in nets, though in very small numbers."[17]

When he reached the Island of Kodiak, he wrote: "Sea, River, and Marsh-otters were formerly taken by thousands. The Sea-otters, which were the principal source of wealth to the [Russian-American] Company, are now nearly extirpated, a few hundreds only being annually collected by the Company. The high prices given for the skins induce the Russians for the sake of momentary advantage, to kill all they meet with, both old and young, nor can they see that by such a procedure they must soon be deprived of the trade entirely."[18]

"The valuable Sea-otters, which were formerly taken in such abundance that in one voyage several thousands might be obtained, are now so much diminished in numbers that scarcely more than between 200 and 300 can be procured annually." Island of Oonolaskha, 1805.[19]

In 1805, Lewis and Clark were on the Columbia River, and wrote, November 3d, "Below Quicksand River . . . the river is wide and contains a great number of Sea-otters."[20]

W. P. Taylor says these animals were abundant along the California coast, at least until the early part of the 19th Century. "Bryant[21] has called attention to the fact that in the year 1801, no less than 16 ships, one English and 15 American, were on the Californian coast, engaged in the pursuit of the Sea-otter. Bancroft, the historian, asserts that 18,000 Otter skins were collected that year for the China market by the American vessels alone. In 1812, as many as 700 or 800 Sea-otters are said to have been killed in San Francisco Bay. These statements may be exaggerated, but they do indicate that the Sea-otter was an important object of pursuit."[22]

Beechey says (1831): "The Sea-otter (*Mustela lutris*) is not an infrequent visitor in the harbour of San Francisco, but very few of them are

[15] Vol. II, p. 221.
[16] As above, p. 202.
[17] As above, p. 213.
[18] As above, pp. 73–74.
[19] As above, pp. 49–50.
[20] Vol. II, 1905 edition, p. 247.
[21] Cal. F. & G., I, 1915, p. 97.
[22] Conservation, pp. 401–02.

taken, notwithstanding their fur is valuable. Judging from the accounts that have been published, these animals are becoming less numerous upon the coast: in 1786, it is stated that 50,000 of them might be collected annually; whereas, at present, the number is reduced to about 2,000."[23]

James O. Pattie, when at the Bay of San Francisco, June 20, 1829, crossed to the Russian settlement of Bodego, accompanied by two Coriac Indians whose occupation was the killing of Sea-otters for the Russians. He described their skin-covered and decked canoes—evidently kayaks—and adds: "Great numbers are thus taken."[24]

Scammon, who wrote in 1874, was just in time to see the last of the great Sea-otter bands, and to write their epitaph. He says: "The number of Sea-otter skins taken annually is not definitely known; but from the most authentic information we can obtain, the aggregate for the past 3 years has been 5,000, 1,000 of which came from the Kurile Islands; and, valuing each skin at $50, amounts to the sum of $250,000."[25]

The Mop-up

"The result of this warfare upon the Sea-otters, with 10 hunters then where there is one to-day, was not long delayed," says Elliott. "Everywhere throughout the whole coast-line frequented by them, the diminution set in, and it became difficult to get to places where 1,000 had once been as easily obtained as 25 or 30. A Russian chronicler says: 'The numbers of several kinds of animals are growing very much less in the present as compared with past times; for instance, the company here (Ounalashka) regularly killed more than 1,000 Sea-otters annually; now (1835) from 70 to 150 are taken; and there was a time in 1826 when the returns from the whole Ounalashka district (the Aleutian Islands) were only 15 skins'

. . . . . .

"When the Territory came into our possession, the Russians were taking between 400 and 500 Sea-otters from the Aleutian Islands and south of the peninsula of Alaska, with perhaps 150 more from Kenai, Yahkutat, and the Sitkan district; the Hudson's Bay Company and other traders getting about 200 more from the coast of Queen Charlotte's and Vancouver's Islands, and off Gray's Harbour, Washington Territory.

"Now, during the last season, 1873, instead of less than 700 skins, as obtained by the Russians, our traders secured not much less than 4,000 skins. This immense difference is not due to the fact of there being a proportionate

[23] Narr., p. 403.

[24] Pers. Narr., p. 218, 1833 edition.

[25] P. 174.

increase of Sea-otters, but to the organization of hunting parties in the same spirit and fashion as in the early days above mentioned. The keen competition of our traders will ruin the business in a comparatively short time, if some action is not taken by the Government; and to the credit of these traders, let it be said that, while they cannot desist, for if they do, others will step in and profit at their expense, yet they are anxious that some prohibition should be laid upon the business. This can be easily done, and in such manner as to perpetuate the Sea-otter, not only for themselves, but for the natives, who are dependent upon its hunting for a living which makes them superior to savages."[26]

"In 1880–1881," says Chase Littlejohn, "because of the persistency with which the animals were hunted by both whites and natives, between 6,000 and 8,000 were taken, some of which I myself secured, and thus helped, I am ashamed to say, in the general extermination. In 1890, the use of the modern rifle and destructive nets had so reduced the income to be derived from Sea-otter hunting, that the hunters were obliged to engage in other occupations."[27]

Concerning the final scenes, Dr. Chas. H. Townsend supplies the following facts: "During the period from 1873 to 1888, the catch of Sea-otters in Alaskan waters ranged from 1,000 to 4,000 annually. Since 1888, the catch has been limited to a few hundreds each year, although the efforts put forth by Otter hunters were prosecuted as vigorously as ever. . . . .

"The data collected by Captain Hooper, presumably from the records of the Alaska Commercial Company, places the total number of Sea-otter skins marketed from Alaska waters from 1873 to 1896, as 58,184. . . .

"The species still exists in the Aleutian and Commander Islands, and in isolated spots to the southward, along the coasts of North America, and Asia, to Lower California and northern Japan."[28] Yes, the creatures exist; but only as scattered hunted fugitives. It is doubtful if the myriad bands of Steller's day are now represented by 1,000, on the whole 5,000 miles of range to which they are still accredited.

Restoration

Russia awoke to the need of protective laws and judicious management 150 years ago. She conserved her heritage in the Sea-otter by rigorously protecting and administering the herd that still frequents Copper Island of the Commander Group. Russian commerce has reaped its due reward;

[26] Elliott, pp. 55–56.

[27] P. 79.

[28] P. 1286.

and it is not at all impossible that the American Government may waken up, and show itself to be as intelligent and progressive as that of Russia, before the present generation has passed away, and before the Sea-otter has gone for ever. Far-sighted men we have long had in numbers, but a far-sighted government is harder to get and maintain.

In 1874, Henry W. Elliott, appreciating the gravity of this question, warned us that the extermination of the Sea-otter was at hand; and with it, the extermination of the 5,000 natives who found in it their support. He wrote to the Treasury officials as follows:

"With a view to check this evil, and to perpetuate the life of the Sea-otter in the Territory, I offer the following suggestions to the Department:

"1st. Prohibit the use of fire-arms of any description in the hunting of the Sea-otter in the Territory of Alaska.

"2d. Make it unlawful for any party or parties to hunt this animal during the months of June, July, and August, fixing a suitable penalty, fine or punishment."[29]

The practical details and question of enforcement were set forth in the rest of this letter, but no adequate action was taken; the work of extirpation went on with ever-increasing effectiveness.

On July 7, 1911, at length, an International Treaty was arranged in the attempt to save this creature from extermination. The United States, Great Britain, Japan, and Russia were the powers who signed it, and by this treaty, restrictions were placed on the killing of the Sea-otter.

This treaty has done some good, as is evidenced by the slight increase of Otters in certain regions. But a dozen years is much too short a time to undo the mischief of 150. An absolutely close time should be agreed on indefinitely, until its purpose is evidently accomplished.

Primitive Range and Haunts

The primitive range of the Sea-otter was all of the north Pacific coast and islands, out as far as 30 miles to sea.

E. W. Nelson says: "In former times, this species ranged over nearly all of Bering Sea; but they are unknown there at present. From the Eskimo of Norton Sound and Bering Straits, I had definite accounts of them; and from the latter place, some of the people claim that these animals occurred there very rarely up to within a comparatively few years."[30]

From Bering Straits that are the gateway to the Polar Sea, it ranges westward to include the Commander Islands and the coast of Kamchatka,

[29] P. 57.

[30] Nat. Hist. Alaska, 1887, p. 253.

southward to the Kurile Islands which are scattered between Kamchatka and the north end of Japan; along the American coast, they extended southward to Cedros Island in Sebastian Bay of Lower California, Lat. 28°.

In primitive times, the Sea-otter lived the life of a Seal; that is, feeding, travelling, and playing in the water; but coming on land to rest, sleep, mate, and bring forth its young. The Otter was, if anything, less of a sea animal than the Seal, as is attested by Steller's full and valuable account. He says:

"As to its habits, it loves to live in the water and on the land; but, for the sake of sweet peace, the Otter inhabits in great droves, by preference, the great islands of the ocean.

. . . . . .

"In the winter, they lie, some upon the ice, some upon the shore. In summer, they go up the rivers, and penetrate even to the lakes, where they greatly enjoy the fresh water. On warm days, they seek the valleys and shady recesses of the mountains, and frolic there like Monkeys."[31]

Thus we see that the Otter was a land animal that sought its food in the sea. Its headquarters were on the rocks and beaches of its range. There it basked for hours, taking to the sea to play and forage, or for escape from land enemies only. Doctor Stejneger tells me that in 1883, when he was at the Commander Islands, he saw as many as 80 at one time hauled up on one island like a herd of Fur-seals. Furthermore, Bering's sailors, scurvy-weakened and poorly armed as they were, could yet get all the Sea-otter they needed for food, by merely rushing and clubbing them as they lay sleeping or basking on the beaches. This was their habit, in all parts of the range.

Haunts and Range To-day

Now what a change! The endless persecution by man has completely established another habit. It is now a pelagic species; 95 per cent. at least of its time is spent afloat.

According to Scammon, "Sea-otters are rarely seen far from shore, their home being among the thick beds of kelp near the beach, or about outlying rocky reefs and islets. Point Grenville, however, seems to be an exception, as there is no kelp in sight from the shore."[32]

"Their home is nearly as much in the water as that of some species of Whales; and as whalers have their favourite 'cruising-grounds,' so, likewise, do the Otter-hunters have their favourite hunting grounds, or points where

[31] Steller, p. 215.

[32] P. 170.

PLATE XCVI.—THE RIVAL FISHERS
Drawing loaned by New York Zoölogical Society

the objects of pursuit are found in greater numbers than along the general stretch of the coast.

"About the sea-board of Upper and Lower California, Cerros, [Cedros] San Geronimo, Guadalupe, San Nicolas, and San Miguel Islands, have been regarded as choice places to pursue them; and farther northward off Cape Blanco, on the Oregon coast, and Point Grenville and Gray's Harbour, along the coast of Washington Territory.

"At the present day [1874], considerable numbers are taken by whites and Indians, about these Northern grounds."[33]

"Over two thirds of all the Sea-otters taken in Alaska," says Elliott, "are secured in two small areas of water, little rocky islets and reefs around the island of Saanach and the Chernobours" [Chernabura, on the south side of the Aleutian chain, about long. 160°].[34]

. . . . . .

"To the southward and westward, and stretching directly out to sea, some 5 to 8 miles from Saanach Island, is a succession of small islets, bare, most of them, at low water, but with numerous reefs and rocky shoals, beds of kelp, etc. This is the great Sea-otter ground of Alaska, together with the Chernobour Islets, to the eastward about 30 miles, which are similar to it.

"The Sea-otter rarely lands upon the main island, but it is found just out of water on the reef rocks and islets above mentioned, in certain seasons, and at a little distance at sea during calm and pleasant weather."[35]

The next famous Otter haunt, going easterly, is thus described by Sheldon: "Tributary to Prince William Sound are four widely separated feeding grounds of the Sea-otter: one off Point Steele, on the east end of Hinchinbrook Island; one off Wooded Island, near the southeast corner of Montague Island; one about midway between that and Middleton Island, near Wessell Reef; and the last, off Cape St. Elias, on the southwest end of Kayak Island."[36]

Much farther south is another famous Sea-otter ground. Of this, Elliott says (1875): "It is also noteworthy that all the Sea-otters taken below the Straits of Fuca are shot by the Indians and white hunters off the beach in the surf at Gray's Harbour, a stretch of less than 20 miles; here some 50 to 100 are taken every year, while not half that number can be obtained from all the rest of the Washington and Oregon coast-line; there is nothing

[33] P. 169.
[34] P. 56.
[35] P. 58.
[36] P. 62.

in the external appearance of this reach to cause its selection by the Sea-otters, except, perhaps, that it might be a little less rocky."[37]

Numbers To-day

Nothing now remains of the sportive Sea-otter herds that enlivened 10,000 miles of surf-environed coast-line, but a few scared, far-scattered fugitives; not in any one region, but hiding here and there throughout the whole ancient range. Since the century began, odd ones have been reported from California round to Kamchatka.

"In 1904, 8 Sea-otters were killed [in the vicinity of Hinchinbrook and Montague Islands, South Alaska]; in 1905, only 3. The previous years averaged from 8 to 15, the number decreasing each year."[38]

In 1911, the Sea-otter had become very rare, and had disappeared from all localities except Point Steele [Pr. William Sound], where one is rarely observed. The natives have, perforce, abandoned hunting the Sea-otter.[39]

In 1914, Preble, after spending a summer investigating this and similar problems, wrote: "Although the species apparently was practically exterminated on the Pribilofs about this time [1841], small numbers remained and single individuals have been reported in a few instances, even during recent years. According to the St. Paul log, a Sea-otter, the first observed, for several years, was reported by fishermen on Sept. 23, 1889. One was found dead at Rocky Point, St. Paul, in June, 1896; and in December of the same year, a live one was reported close to shore, in Southwest Bay. Skulls or other remains, probably of animals long dead, are still occasionally found."[40]

The only available recent Canadian records are as follows: "I found a Sea-otter skull in a deserted cabin near Rose Spit [Queen Charlotte Ids.]. Chief Harry Wiah said that about a year before our visit, an Indian shot at a Sea-otter which was resting on kelp near North Island. He also said that about 30 years ago, his father, his wife's father, and other Indians—a total of 19 boats—got 21 Sea-otters in a forenoon, and 6 in the afternoon."[41]

J. R. Lowther, of Victoria, B. C., writes me, Oct. 2, 1924: "The Sea-otter sometimes visits the coast of Vancouver Id. Several were observed on Saanich Arm, near Victoria, in 1913."

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[37] P. 56.

[38] Sheldon, p. 63.

[39] As above, p. 63.

[40] P. 130.

[41] Clyde A. Patch in Can. Field Nat., Sept., 1922, p. 103.

In California, they seem to have made protection more effective. They have at least more Sea-otters, as is attested by the following: "Individuals and small companies are still observed in the vicinity of Point Sur, Monterey Co., and there is some evidence to indicate that since the passage in 1913 of the law giving them rigorous protection, they are increasing slightly."[42]

The following notes are encouraging: "Two Sea-otters were seen basking in the sun in the kelp beds off Del Monte between Seaside and Del Monte wharf, on Oct. 22, 1916. They were apparently an old and young one; and the theory is that the old one came back to look for one of her young which was caught in a sea-bass net last year."[43]

"On March 18, 1916, 31 Sea-otters, 2 being young ones, were seen to the south of Catalina Island. Although one has occasionally been seen in this locality before, this was the largest number, to my knowledge, counted at one time."[44]

"For some time after the commercial extermination of the Sea-otter on the Pribilofs, many of the animals retained a foothold among the Aleutian Islands and in other parts of the North Pacific; but the incessant persecution to which the species was subjected gradually reduced it to the verge of total extinction. Now, the pitiful remnant left is protected for a term of years in the hope that the species, which ranks among the most valuable of all fur-bearers, may gradually repopulate its former haunts."[45]

The Robe and the Flesh

The wonderful robe that has proved his undoing, is not taken off beaver-fashion, but cased like Otter and Fox; that is, removed by turning it inside out from a single slit made across the hind legs. Usually it is stretched, so that Sea-otter skins 6 feet long are occasionally seen, though 4 or $4\frac{1}{2}$ feet are considered maximum lengths for the animal itself.

In 1785, the price of a skin was $6 to $7.[46] "In 1880, the average skin taken off our coast brought $80, while, in 1910, the average price paid for Sea-otter skins in London was said to be $1,703.33."[47] Since then, it has steadily climbed, and $2,000 and $2,500 became common prices during the

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[42] Taylor, p. 402.

[43] P. H. Oyer, Cal. F. & G., April, 1917, p. 88.

[44] Geo. Farnsworth, Cal. F. & G., April, 1917, p. 90.

[45] Preble, p. 130.

[46] Bryant, Cal. F. & G., 1915, I, p. 97.

[47] Taylor, p. 402.

Plate XCV. Sea-otters

E.T.S.

1920 fur boom. That is, it is the costliest fur in the world, far out-pointing the choicest Silver Fox in recent markets.

It seems that such moults as it undergoes are gradual, so that the pelt is nearly always prime—a sad thing for the Sea-otter, as this makes the hunting season last the whole year round.

The flesh is a staple of native diet. Steller says: "The flesh of the young Otter is most delicious; it cannot easily be distinguished from the flesh of an unweaned lamb, whether roasted or boiled, and the gravy from its preparing, in either way, is most delicious. Otter flesh was our principal food on Bering Island; it was also our universal medicine. By its use we were saved from scurvy, and no one got sick of it, although we ate it every day half raw and without bread. The liver, heart, and kidneys tasted exactly like those of the calf. The natives of Kamchatka and the Kuril Islands give the first preference to the flesh of eagles, the second to Otter's flesh. The liver and kidneys they eat raw, and declare them most excellent."[48]

Food

Steller's account of its food is very complete for the time and place in which it was written. He says: "For getting food, it seeks, when the tide is out, the shallow, rocky reefs overgrown with seaweed; and there devours crustaceans, mussels, clams, snails, limpets, polyps, cuttlefish. Only when forced by hunger to do so do they eat seaweed; but they eat fish, smelt, and a little fish called in Kamchatkan idiom the *Uiky*, which is washed in by the spring tides in countless numbers. They are also fond of meat. I have seen an Otter eating the flesh of another Otter which had been skinned and thrown away. It may therefore be concluded that this animal is omnivorous." (P. 215.)

Elliott gives a similar list, but adds "sea-urchins, of which they are very fond, and which they break by striking the shells together, held in each fore paw, sucking out the contents, as they are fractured by these efforts; they also, undoubtedly, eat crabs, and the juicy tender fronds of kelp or seaweed, and fish."[49]

Scammon and Swanson endorse the above, but the latter emphasizes the kelp.

However, a recent writer, H. G. Snow, whose 20 years of experience hunting the Sea-otter, lends authority to his statement, asserts that the examination of hundreds of Sea-otters' stomachs reveals the fact that crabs,

[48] P. 217.

[49] P. 60.

sea-urchins, sea-squirts, and a substance that looked like fish-spawn are chiefly fed on. He found no trace of seaweed, clams, limpets, or mussels, and very seldom of fish.[50]

Littlejohn gives more picturesque details, also a curious and exceptional incident. "The food of the Sea-otter," he says, consists largely of sea-urchins, for which the Otter dives to the bottom. He comes to the surface with the food, places it on the breast, where it is torn in halves; the contents are taken from each half, and the shells are tossed often to a considerable distance. The Otter then washes and cleans his face and 'hands,' before diving for more food. Otters also eat seaweed and fish, but probably not much of the latter, with the exception of the squid, upon which they are obliged to subsist when driven far out to sea by constant hunting. They are unable to reach bottom when the water is much over 60 fathoms [360 feet].

"That Sea-otters eat codfish, is in a measure proven by the following interesting incident: Our schooner was anchored about 20 miles from land, in 60 fathoms of water. Codfish were abundant, and one man was fishing while a number looked on. The weather was extremely foggy, and presently a Sea-otter, drifting by, and apparently mistaking the schooner for a rock, swam towards it. Rifles were at once secured, but in the meantime, the Otter had dived, and was apparently lost. Presently, however the fisherman got a bite, and after hauling in the fish for a considerable distance, was suddenly surprised to find the strain on his line greatly increased. We were all curious to see what he had hooked, and found an Otter clasping the codfish in his paws. A bullet soon ended his career."[51]

According to Swanson, "They range for feeding about 60 miles. They have special feeding-grounds in shallow water, on 'banks,' or near the shore, and feed at night. In the day, they go off shore, often 30 miles or more, and sleep. They seem to have well-defined ranges over which they feed, and, though they may be temporarily driven away by too much hunting, sooner or later they return to the familiar feeding-ground."[52]

All modern observers herein quoted, agree that the Otter seeks its prey on the bottom of the sea, and dives to get it in from 5 to 30 fathoms of water; that is, 30 to 180 feet. Littlejohn says twice that. What other mammal—I nearly said land animal—has such power? Probably none, outside of the Whales and Seals.

As soon as the diver comes back to the surface with its prey in its

[50] Forbidden Seas, pp. 278–80.

[51] P. 81.

[52] Sheldon, p. 58.

teeth, it resumes its habitual attitude—on the back—to devour it comfortably with both paws free, as the food lies on the broad, flat table of its breast.

Some observers say that this animal feeds only by night. In discussing the question, it is well to remember that in the far north part of its range, there is little night in summer time, and little day in winter. Next, that in the gloom of ocean depths, down 100 feet in the beds of swaying, broad-leaved kelp, there is never any day, and all food-finding must be by touch.

Mating and Young

Steller's observations on this subject may well be quoted entire. He says: "They play together, and, like human beings, embrace with their arms, and kiss each other. . . .

"They copulate at all seasons, and so, throughout the year, the mothers are seen busy with their cubs. Whether they give birth twice within one season, I would not venture to decide; but I have seen, and I have sometimes killed, mothers with two cubs, one of which was a year old, and the other 3 or 4 months old. So much is certain, they never, or at most very rarely, give birth to more than one at a time.

"The first year after they are born, they do not copulate, but the second year, they do. The period of gestation is 8 or 9 months; and so, they bring forth perfectly developed young, with eyes open, and with all their teeth; the 4 canine teeth are smaller than common, just as I have observed, also, in the case of the Sea-bears, Seals, and Sea-lions."[53]

According to Snow, "the female Otter has only two teats, and, as a rule, produces but a single young one at a birth." He says, however, "I have seen 2 young ones with their mother, and have taken 2 fœtuses from the womb of an Otter which I had killed."[54]

Steller continues: "They suckle their young almost a whole year. They preserve their conjugal affection most constantly, and the male does not serve more than one female. They live together both on sea and on land. The one-year-old cubs, the *koschloki*, live with their parents until they set up housekeeping on their own score. Rarely, therefore, are females seen apart from cubs two or three months old, which are called *medviedki*.

"The females always give birth to their young on land. Whether in the sea or on land, they carry their cubs in their mouths; but when they sleep at sea, they fold their young in their arms just as mothers do their

[53] P. 216.

[54] P. 277.

babes. They throw the young ones into the water to teach them to swim, and when tired out, they bring them to shore again, and kiss them just like human beings. They toss the young out into the sea, and with their paws catch them when tossed, like a ball; and with them, they engage in all the delightful and gentle games that a fond mother can play with her children.

"When the mother sleeps on shore, the cubs keep watch, clinging to her dugs or arms. They embrace their young with an affection that is scarcely credible. When hunters press upon them, whether by land or by sea, they seize their young with their mouths, and never let go of them except when compelled by extreme necessity or death itself. And so they are killed often when they might have got away themselves. I have sometimes deprived females of their young on purpose, sparing the mothers themselves, and they would weep over their affliction just like human beings. I once carried off two little ones alive, and the mothers followed me at a distance like Dogs, calling to their young with a voice like the wailing of an infant; and when the young ones heard their mothers' voice, they wailed, too.

"I sat down in the snow, and the mothers came close up and stood ready to take the young ones from my hand, if I should set them down in the snow. After 8 days, I returned to the same place, and found one of the females at the spot where I had taken the young, bowed down with the deepest sorrow. Thus she lay, and I approached without any sign of flight on her part. Her skin hung loose, and she had grown so thin in that one week that there was nothing left but skin and bones. This happened several times in succession. It happened one other time that, in company with Mr. Plenisner, I saw in the distance a mother Otter sleeping with a year-old cub. When she caught sight of us, the mother ran to her offspring, woke him up, and warned him to flee; but, as he preferred to go on sleeping rather than to run away, she picked him up in her paws in spite of himself, and rolled him like a stone down into the sea."[55]

When the young one "is old enough to be fed," says Swanson, "she breaks clams and shellfish with her teeth and inserts the food in the young one's mouth. When she dives for food, she leaves the young one on top of the water."[56]

She is ready to risk or give her own life for her little one, so, when carrying it to escape from hunters, does not dive deep and far, as if alone; but plunges only "at short intervals, for she well knows that if she remains too long beneath the water, the young will perish. Each time the surface is reached,

[55] Pp. 216–17.

[56] Sheldon, p. 58.

the little fellow utters a loud cry, and this at once attracts the attention of the hunter. To deaden the outcry, the mother will often duck the head of her offspring beneath the water repeatedly. When the weather is foggy, the only Otter that can be chased with any degree of success is the mother with her baby, whose cries betray her."[57]

Alexander Allen, a sportsman, whose recent book of adventures on the Kurile Islands gives new light on the Otter, dwells especially on the mother's unselfish devotion to her young. If alone, she could easily escape from the oncoming boat. Three long dives she knows will bring her into the safe refuge of yonder fog-bank. But three such dives she knows will kill the baby; and she dies rather than desert her whimpering charge.[58]

"A female is easily killed if she has a pup," says Swanson, "because she will leave it only to dive, and always come up close to it. When hit, if not killed immediately, she will grab the pup, and hold it with her fore flippers until her death convulsions. The young one cannot dive, and often, after the dead mother has been picked up, it will swim up to the bidarka and bawl, when it can be easily taken alive."[59]

"The pup cannot live without its mother, though frequent attempts have been made by the natives to raise them, as they often capture them alive, but, like some other species of wild animals, it seems to be so deeply imbued with fear of man that it invariably dies from self-imposed starvation."[60]

The pup must be 6 months old to feed itself, evidence of recent adaptation to its tremendously specialized life. It stays in the mother's care, and is suckled for a year at least, according to Elliott, and longer if the mother has no new baby.

"By the time they are 2 years of age, they are 'prime,' though the animal is not full grown till the fourth or fifth year."[61]

Recent observers have added little to Steller's account of the mating. Elliott says: "They are not polygamous," which probably means that they are monogamous, as indeed are most of their kinsfolk, the *Mustelidae*.

A strong presumption of high-class monogamy is contained in this observation by Littlejohn, who hunted the Sea-otter more than 40 years ago in the Japan Seas. "Often just a family would be together—a father, mother, young of the previous year, and the baby. These, when pursued,

[57] Littlejohn, p. 81.

[58] Hunting the Sea-otter, London, 1911.

[59] Sheldon, pp. 61–62.

[60] Elliott, p. 59.

[61] Elliott, p. 59.

would usually still band together, and the whole family would then be destroyed by the merciless bullets of the hunter."[62]

Further, Elliott says that the sexes are alike in colour and size; both manifest the same deep solicitude for the young. All of these are characteristics of a monogamous species, and unknown among the polygamous.

Manners and Customs

For study of the creature, no one has had such opportunities as Steller. He lived with and on the Sea-otter for months. He saw them daily in thousands when they were still in the Garden of Eden stage. They lived their lives about him, unafraid. From Steller, then, I quote:

"They surpass all other amphibia in play and frolicsomeness, and in fleetness of foot.

"On the land, they lie as Dogs do, with the body curled up. As they come out of the sea, like Dogs, they shake off all the water before they lie down to sleep; then, with their paws, they wash their faces, just as Cats do, smooth out their bodies, straighten out their fur, turn their head from one side to the other as they look themselves over, and seem to be greatly pleased with their personal appearance. I have also seen the males play with their genital organs like Monkeys. When they are engaged in sleeking their fur, they are so intent upon it that they can be killed readily.

"A swift runner can scarcely overtake an Otter when it runs, for it runs with many windings, in a fashion to mislead. When it sees its path to the sea intercepted, and finds itself exhausted and out of breath, it puts up its back like a Cat, threatens to leap upon its pursuer, and spits like an angry Cat. . . .

"When it receives a vigorous blow upon the head, it falls upon the ground, covers its eyes with its paws, and keeps them so, no matter how many times it is struck upon the back. But if one hits it upon the tail, which is extended out as the animal runs, it turns about and faces the striker in the most absurd fashion. But more frequently it happens that they fall down at the first blow and pretend that they are dead. And then, as soon as they see that we turn our attention to others, they suddenly take to flight. From this, it would appear that the animal is very cunning.[63]. . . .

"If they escape the club, they gesticulate in a very ridiculous manner, as if making fun of the hunter. With one paw raised over their eyes, as if

[62] P. 81.

[63] P. 215.

bothered by the rays of the sun, they watch the man, continually rubbing their pudenda, as they lie upon their backs, and then go off into the water, still watching the man steadily and urinating as they go, in the same way as Sea-bears and Whales always do.[64]

"Oftentimes, we would drive them into narrow places on purpose, without any thought of doing them any harm; we would hold our clubs ready, and they would fall down, fawning and looking around in every direction. Then they would slowly slink past us like Dogs, and as soon as they saw that they were out of danger, they would hurry with mighty leaps to the sea."[65]

Habits To-day

But these were the days when the Sea-otter was a land animal that occasionally took to the sea. Now it is a sea animal that rarely lands.

The sum of all available evidence is that to-day it spends its whole life at sea: eats, sleeps, mates, and produces its young, out on the great heaving swell among the long yellow ropes of kelp. Never is it compelled to land for the ordinary functions of life, unless once or twice a year for some unknown reason. The question of drink is possibly involved. The Sea-otter either drinks sea water, or lands to get fresh water, or goes without any. Stejneger is of the opinion that they get all the water they need by skin absorption in the sea. Elliott implies that occasionally the mother takes her young one out on the rocks,[66] and again, "the Sea-otter rarely lands on the main island [Chernabour], but it is found just out of water on the reef rocks and islets above mentioned [as near by] in certain seasons."[67]

Scammon says that it is "occasionally taken while asleep upon the rocks";[68] and yet, four lines above, he quotes old hunters as saying that it "is never seen on shore unless it is wounded."

So far as I can balance the evidence, it means that a hale and hearty Sea-otter to-day spends its entire life at sea. A sick one, a wounded one, or a mother with a sick baby, lands on rock or other footing, no doubt for reasons excellent, but not obvious.

But the Otter knows the perils of such a place. At the slightest whiff of danger, it seeks the depths. "There is no driving these animals out upon land," says Elliott. "They are fierce and courageous, and when

[64] P. 216.
[65] P. 215.
[66] P. 59.
[67] P. 58.
[68] P. 169.

surprised by a man between themselves and the water, they will make for the sea, straight, without any regard for the hunter, their progress, by a succession of short leaps, being very rapid for a small distance."[69]

All observers extol the sagacity of the Sea-otter, and as a product of the same high mental development is its curiosity. An animal without curiosity means without the desire to know more. Curiosity is a great and dominating impulse, in exact proportion to the creature's mental development. A Chimpanzee has much more curiosity than an oyster. A Chimpanzee knows more than an oyster. So the big brown inquiring eyes of our mermaid are a fair index to its brain equipment—a measure of its mind.

Enemies

Of course, the deadliest enemy of the Sea-otter is man. The weather, the wild beasts and fishes, the inevitable insect parasites, he could and did withstand for ages. Even man with bow and spear he could elude, but when man came with deadly modern guns, power boats, nets, and ceaseless pursuit by an army of trained hunters, he was overmastered at last. Of this in another chapter—a black funereal chapter, the Hunting of *A-mi-kuk*.

Of all the enemies native to his seas, the Otter dreads most the Killer Whale, the terror of the Northwestern seas, a Whale about 20 feet long, with the speed of a turbine, the voracity of a Shark, the jaws and ferocity of a pike.

They rove the seas in small bands of 3 to 15, and woe be to the creature—flesh, fish, or fowl—that crosses their path during their hunger spiel. Nothing is safe from them; not the biggest Whale—three times the length and 20 times the weight—has a ghost of a chance against them. They hound him and harry him as a pack of Wolves do a big fat steer. He may throw them off for an hour or two. His mighty tail may beat them back for a dozen rounds, but they fasten like bulldogs on his big soft throat and lips, they tear his belly open with their crocodile teeth, they rip his thick soft hide till his red life is run, and they pick his bones till they sink. There is nothing roving sea or land so terrible as *Orcinus orca*, the Killer Whale. And when the tall black dorsal fins of a Killer school come sheering the ocean's open stretch, every creature else knows and fears, and seeks safety in precipitate flight.

Commenting on this, says Littlejohn: "The Sea-otter displays much common sense and sometimes remarkable strategy. Its greatest enemy other than man is probably the Killer Whale. This animal destroys great numbers of Fur-seal, which it finds easy prey. In the excitement of pur-

[69] P. 62.

suing its prey or playing with its friends, the Seal makes a great commotion by leaping out of the water. This attracts the Whale, and the Seals are soon dispatched. The Sea-otter, likewise, makes off instantly from this enemy, but if he finds that he has not evaded his pursuer he knows that flight is useless; he then doubles up as if dead and remains motionless. The Whale does not eat carrion, and thinking this to be such, he passes on to the living Otter that has seemingly escaped."[70]

If those sportsmen who have yachts and guns, would make an effort to reduce these terrors of the Northern seas, these deep-water crocodiles, they would have all the excitement they wished, and at the same time do protective work for Seal, Whale, and Sea-otter.

Second to the Killer Whale is the Sea-lion, discovered by Steller (*Eumetopias stelleri*), 11 or 12 feet in length, 1,000 lbs. in weight. It is a meat-eater and a pirate. Many a Sea-otter, a large percentage of all Sea-otters, indeed, find their last rest in the Sea-lion's capacious maw. There is much of comfort in the thought that the Sea-lion, too, is in mortal dread of the Killer.

From these two terrors, the bright brave Sea-otter has two or three protections. One is to fly fast and far when his piercing eyes see the black back-fin of the Killer or the burly brown back of the Sea-lion, cutting their foaming way in the offing. The next, as already noted, is to play Possum, to lie like a drift log, freeze like Molly Cottontail, so the great stupid brute see them not and go by. The last is to hide in the blessed groves of kelp. What the brier bush is to the Cottontail, the kelp bed, tall and spreading in a level top, is to the Sea-otter—his home, his refuge, his hiding place. In its friendly mazes he can hide, and with an inch of his nose out under 2 inches of kelp, wait hours if need be. The Killer can thread the kelp beds just as a man can scramble through a brier patch, but it is not pleasant work, and quite unlikely to be profitable, so he seeks it not. Without the kelp beds, the Sea-otter would have passed long before man ever came on the scene. Without the kelp beds, indeed, the Sea-otter never would have been.

The Hunting of Amikuk

A creature that carries a robe worth $1,000, the most precious in the world, in a region where there are no restraining laws, is sure to be hunted without let-up or moderation, hunted till he is done for, and despoiled of that robe.

There has never been a harder, more relentless chase than that of

[70] P. 81.

Amikuk of the North. Many chapters could be filled with the records of that wild, desperate pursuit. It is always on a sea of perils. But my purpose is to show the ways of the Otter, not of the hunter, and I shall give only some hunting accounts that help us to know the life and the little mind of the Hunted One.

At no time easy to follow, for the Pacific Ocean is never pacific, the Otter hunt in the North is work for none but the strongest and most daring of men.

"Thirty-eight years ago," says Littlejohn, "on the 18th of March [1878], I sailed on my brother's ship on my first Sea-otter hunt. We sailed from San Francisco by way of the Sandwich Islands. The Kuril Islands were reached in May, and we at once began the hunt. And truly exciting and dangerous sport it was! To hit with the rifle so small a mark as an Otter's head (practically the only part to be seen) from a bounding boat was at first no easy matter; but with practice the Otter soon stood but little chance when hemmed in between the boats. The hunting was both difficult and dangerous, for the waters about the Kuril Islands are at nearly all times very rough, because of the violent winds and rushing tides. I saw one hunter caught in a tide-rip: his boat stood on end for a moment and then plunged beneath the surface. Many lives were lost in this occupation, and of the hundreds who followed it for a long period, I am perhaps the only one left who can tell from personal experience, about the life and habits of the nearly extinct Sea-otter. My own brother with his crew of about 30 men were the last Otter hunters, so far as I know, to sail from San Francisco. The expedition left on March 1, 1889, and like many another unfortunate ship that sailed for the same purpose, was never heard from again."[71]

Every possible means is used if only it promise to bring that precious robe into the power of the daring, hard-hearted, hard-handed seamen who follow this desperate chase.

When stricken to death by man-made missiles of destruction, the Otter "floats, back up, and the body takes the shape of an inverted letter U, both ends down. This causes the air to remain in the lungs, and to act as a float." If, by any chance such as an open wound, the air escapes, the body sinks at once and is lost.[72]

The creature's speed, courage, and daring prowess are of the best. Eyes, ears, and wonderful nose—all are needed in his wit-match with man. Steller saw them gaze in fearless curiosity at his camp-fire. But they have learned another thought since then.

[71] P. 79.

[72] Littlejohn, p. 80.

Elliott says the Otter "will take alarm and leave from the effects of a small fire, 4 or 5 miles to the windward of them; and the footstep of man must be washed by many tides, before its trace ceases to alarm the animal, and drive it from landing there, should it approach for that purpose."[73]

The greatest care is taken by the Sea-otter hunters on Saanach. They must not scatter or empty food refuse on the beaches. Even in fearful zero weather, they must for weeks l ve entirely without kindling a fire—they must not even smoke, except in certain winds that they know will not betray them.[74] For the Otter, miles off, will get that whiff of danger, and travel many a league and far away.

His Way of Life

Of all the creatures living in the cold North seas, the Sea-otter is alone in that he usually swims on his back. Sailing, paddling, shooting or diving he goes, with his back to the deep, and his shining breast to the sky. But his neck is doublebent, so his big soft eyes sweep the blue world above and around. Propelled almost wholly by his big finlike hind feet, he moves with easy sinuous sweeps through the swell with its huge broad fronds of kelp—with back first, he ever goes forward, until the moment comes to dive—supple as an eel he turns—back up like Seal or Beaver, and down he goes—down, down—long strings of silver bubbles mark the course, and by a strange atmospheric change, the colour of the black merman now is yellow-brown as a seaman's slicker, or golden as a bunch of kelp. Down 30 to 100 feet or more he goes, and gropes around in the gloom, until he finds some big fat squid or sea-urchin. He does not hurry, for he can stay under 4 or 5 minutes. Then up he comes with the prey in his jaws, back to the top, to the borderland, that eternal line between the two kingdoms of air and water, on which he lives.

Here again on his back he lies, as, using his broad chest for dinner table, he tears open the sea beastie, feeds on its meat, and flings its shell aside, if it have any. Then he repeats the dive, and the feasting, until his sleek round belly is well filled. Now, among the heaving, friendly kelp he lazes on his back, plays ball perhaps with a lump of the leathery weed, tossing it f.om paw to paw, taking keen delight in his cleverness at keeping it aloft, as a juggler does his balls; and sniffing in disappointment if he should foozle the ball and miss the catch.

Other Sea-otters are about him, for Amikuk, like most fishermen, is of

[73] P. 60.

[74] Elliott, p. 58.

a neighbourly spirit and loves good company. His mate may be there with her water baby in her big motherly lap. She tumbles it off into the deep for a swimming lesson; and round and under she swims to exercise "the kid," and make it learn. This is a very ancient game, this water-tag; the earliest monad that ever wriggled tail in the hot first seas, no doubt invented it. It is deep in everything that swims, or moves, and loves good company; so father Otter pitches in, and plays it, too. For half an hour they may keep it up. Father is still strong and frolicsome; so is mother; but the water baby is tired. Its big round eyes are blinking in weariness, and it is ready for sleep. Trust mother to look out for the little one. She curls up and takes it, not pick-a-back, but in the snug bed that she makes by curling belly up, as she floats among the weed. Her four feet are the bedposts, and in some degree the coverlet, too, for she holds it to her breast, crooning softly to it, till its whimpering ceases and it sleeps. Its fur may be wet and cold, but its skin is dry and warm; and drifting like a log of drift among that helpful wrack, they float, and love the lives they live.

But father is full of energy. He is one of thirty or forty that herd along this bed of kelp, that marks a deep-down feeding ridge, where their shiny seafood swarms. And away they go, in a race that recalls the tremendous speed and energy of the Porpoise in the sea. Undulating like water serpents, or breaking from the side of a billow, to leap in a long curve, splash into the high wet bank of the next; one after another they go, racing round, in air or far below, diving, jumping, plunging, somersaulting, back up, belly up, or sides up—it matters not, so they speed, for the joy of rapid flight, for the wonderful pleasure of using their pent-up energy in mastery of the elements about them.

Strange as it may seem, these merry games have mostly place in rough and heavy weather, almost a storm. Swanson says that, on calmer days, they are never seen playing; that is, the bands of older ones are not. They need the stimulus of a contest with the waves before they do their wonderful best. In quiet times, they are more likely to sleep.

Usually, when one is seen, it is sleeping; otherwise they are too alert to be easily discovered. And even at this time, none but the keenest, best-trained eyes can find them, for the body is sunk below the surface; only the head and flippers show. They have no look of a furry animal form, but pass for a black drift log with snags.

As they float their merman way, they are frequently seen with hind flippers raised and spread, as if catching the breeze to sail or drift before it.

On sunny days, so rare in their wild, stormy ocean home, their big brown eyes might suffer from the unwonted glare; but as they float and

dream, they sometimes shade their eyes with one idle paw; just as one of us might do, if we could swim that way, and faced the light.

They do not have those big, fawn-like eyes for nothing. Their vision is all it should be, for such perfect organs. Their ears, too, are keen; but of all their senses, smell is their best, the safest sentinel that guards their life.

Best equipped is he, in this respect, of all the wild things in the wild and windy North. But also hardest pressed. For that matchless robe, worth its weight in gold, has the force of a blood-price on his head. Many a brave and valiant man has been hunted down for less reward than the fetch of this wondrous pelt.

As one reads the full account by Steller, one gets the impression of humanization almost too much, and might question the accuracy of some details. But they have been endorsed by Elliott, Scammon, Stejneger, Snow, and many others since.

And as one reads of its mild and human face, its fish-like hinder parts, its human arms, in which the mother, two-breasted, carries her whimpering babe, and croons it to its slumber, or plays with it, as she sports in the rolling surf, can one not readily believe that in this we have, perhaps, the original of the mermaids and the mermen of the ancient tales?

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The Canada Otter, American Land Otter, River Otter

Lutra canadensis (Schreber)

(L. *Lutra*, an Otter; *canadensis*, of Canada)

Mustela lutra canadensis SCHREBER, 1776, Säugthiere pl. 126 b.
Lutra canadensis SABINE, 1823, Franklin's Narr., Journ. Polar Sea, p. 653.

TYPE LOCALITY—Eastern Canada, i. e., Quebec.

FRENCH CANADIAN, *la Loutre du Canada.*
CREE, OJIBWAY, AND SAUTEAUX, *Ne-geek'.*
MONTAGNAIS (Labrador), *Un'-chuch.*
CHIPEWYAN, *Nop'-e-ay.*
YANKTON SIOUX, *Pe-tang.*
OGALLALA SIOUX, *Ptan.*

The genus *Lutra* (Brisson, 1762) comprises weasel- ike animals of large size, with short legs, long tails; adapted for life in the water, having dense oily fur, webbed feet, etc. The teeth are as follows:

$$\text{Inc. } \frac{3-3}{3-3};\quad \text{can. } \frac{1-1}{1-1};\quad \text{prem. } \frac{4-4}{3-3};\quad \text{mol. } \frac{1-1}{2-2}=36$$

In addition to these characters, the Canada Otter has the feet with more or less hairy soles; also:

Size. Length, about 40 in. (1,010 mm.); tail, 12½ in. (317 mm.); hind foot, 4 in. (102 mm.).

Weight. A ♀ collected by Doctor Merriam, on Birch Creek, Ida., Aug. 14, 1890, weighed 19 lbs. (8½ kilograms); a young one with her weighed 10 lbs. (4½ kilograms); both were fat.[1]

A fat Alaska ♂ taken on the north fork of the Kuskokwim, weighed 13 lbs.[2]

Bachman gives the weight of a specimen from Carolina, at 23 lbs., of one from Colorado, Texas, at 20 lbs.[3]

Manly Hardy says: "18 to 20 lbs.; 25 lbs. being exceptionally heavy."[4] So that 20 lbs. may be considered an average weight for the Otter.

[1] N. A. F., No. 5, 1891, p. 82.
[2] Dice, Journ. Mamm., Feb., 1921, p. 23.
[3] Q. N. A., II, pp. 4–5.
[4] The Otter, p. 330.

Colour. In general, the colour is dark, rich, glossy brown, becoming paler and grayer below; the brown of the head and muzzle changes on lips, cheeks, chin, and throat, rather abruptly, into a pale brownish gray, almost a grayish white. Some specimens are much paler.

In the American Museum is an albino, or nearly white, freak from Alaska.

Manly Hardy mentions that in handling some 5,000, during more than 60 years' experience, he saw only 5 white Otters, and heard of 3 others; the 5 were taken in the same limited area.[5]

The Muskrat is protected against the cold water by a fine robe of dense fur; the Whale by a thick layer of fat under the skin; the Otter is happy in the possession of both, and can enjoy the coldest of water in the coldest of weather.

Races

The following forms have been recognized:

canadensis Schreber, the typical form. T. l., Eastern Canada.

lataxina F. Cuvier, the smallest of the races, with feet sparsely haired beneath; much lighter than *canadensis*. T. l., South Carolina.

vaga Bangs, larger than *canadensis;* tail longer; colour redder. T. l., Micco, Brevard Co., Fla.

pacifica Rhoads, a large form; lighter and browner than *canadensis*. T. l., Lake Keechelus, Wash.

sonora Rhoads, large; with long hind foot; generally pale. T. l., Montezuma Well, Beaver Creek, Yavapai Co., Ariz.

degener Bangs, a small and puny form. T. l., Bay St. George, Newfoundland.

periclyzomae Elliot, skull large; temporal region constricted; rostrum short and very broad. T. l., Moberly Id., Queen Charlotte Ids., B. C.

brevipilosus Grinnell, like *pacifica* and *periclyzomae*, but larger, paler, with shorter fur. T. l., Grizzly Id., Solano Co., Calif.

interior Swenk, like *canadensis*, but slightly paler, and distinctly larger, with shorter hind foot and smaller skull. T. l., Lincoln Creek, Seward Co., Neb.

annectens Major, the Mexican Otter, quite distinct, but added to complete the North American list. *Repanda* and *latidens* are races of the same. T. l., Rio de Tepic, Nayarit, Mexico.

[5] The Otter, p. 372.

MAP XIII.—RANGES OF THE NORTH AMERICAN OTTERS AND OF THE SEA-OTTER

By E. T. Seton, with assistance of the Biological Survey

The Canada Otter and its races are shown in Canada and the United States. For completeness, *Lutra annectens* with its three races is shown.

Range of the Sea-otter shown by crosses.

Range

A glance at the map shows that the Otter is found throughout North America, where there are forests and water. On the north, the ranges of Otter and timber coincide so exactly that we may look for extension of the Otter range on the south where long arms of timber lands have pushed into the open country.

The following records are of interest:

"Sonoran Otters are occasionally caught in the Colorado River. While not common, they are not very rare."[6]

"Streams of northern California, south at least to Mendocino County, and through the Sacramento and San Joaquin Valleys to the San Joaquin River, Fresno County."[7]

Present Distribution

The species never was abundant anywhere, and continual persecution has considerably reduced its numbers. Yet it is still found throughout America, even in highly settled regions, where its presence is not suspected. The following records illustrate the point:

"The Otter is a common inhabitant of the Adirondacks."[8]

W. E. Cram writes me that in the winters of 1901 and 1903 he trapped 4 Otters, shot 1, and saw others along Exeter River and Old River, near Hampton Falls, N. H.[9]

"Otters are still found in the Hudson, and in the streams and lakes of the Highlands, though the species has now become extremely scarce."[10]

"Otters were said by one or two of the Catskill residents to have been taken occasionally along Schoharie Creek, and at Kaaterskill Lake during the past 25 years. We saw no signs of them."[11]

The Editor of *Forest & Stream* thus comments on the Otter in New England:

"It is not commonly known that Otters are sometimes caught in Massachusetts to-day; yet there are more of them in that State, and generally in the Connecticut River valley, than would be imagined. A long letter in

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[6] Stephens, Calif. Mamm., 1906, p. 234.

[7] Grinnell, Mamm. Calif., 1913, p. 297.

[8] Mamm. Adir., p. 87.

[9] Personal letter, Feb. 26, 1925.

[10] Mearns, Vert. Faun. Hud. High., 1898, p. 347.

[11] Mearns, Mamm. Catskill Mts., 1899, p. 360.

Science from C. E. Gordon, in November, 1908, gives much interesting information on this point. . . .

"The surprising abundance of these animals in the Connecticut valley is thus shown, and seems to be a matter deserving of record. . . . Dr. Glover M. Allen reports that they are occasionally seen about the Charles River in the eastern part of the State, he having found unmistakable tracks of the Otter near Dedham, Norfolk County, two winters ago."[12]

Prof. John J. Schoonhoven of Brooklyn records a specimen taken in Pound Ridge, Conn., "a year or two ago."[13]

"At one time evenly and numerously distributed, [in Pennsylvania & New Jersey] it has become rare almost everywhere, and in many places, is only known as an occasional straggler."[14]

"Three or four have been killed in the southern part of Ohio within the last 5 years, along the Ohio and Scioto rivers. Traces of others have been seen recently."[15]

Haunts and Home Range

Frequenting invariably the water, or the vicinity of water, the Otter finds its ideal surroundings in good-sized clear streams that abound with fish, and that are much varied in bank and bed by pools, rapids, log-jams, and overhanging rocky banks. It never *lives* far from the water, and in summertime never goes far overland; but in winter, its habit changes somewhat. Then it frequents rapids and falls which have defied the frost, and makes long overland journeys to seek them.

All trappers agree that the Canada Otter is a wide-ranging animal. The evidence goes to show that its habits bear a close resemblance to those of its British congener, and as this latter has been closely studied by many naturalists, it may furnish important side-light.

In Great Britain, it is well known to be a far traveller. T. W. Proger, of Cardiff, writes me: "I have known one to go 5 or 6 miles overland in a single night, to a stream that promised good fishing. An Otter will range for 25 miles up and down a given river; and the scarcer the fish, the farther he wanders."

Merriam gives a number of illustrations which tend to show that each Otter in the Adirondacks has a certain route or range that is his own little kingdom. Up this river to that branch, along that to the swamp, then

[12] Forest & Stream, Feb. 20, 1909, p. 291.

[13] Guide to Nature, Mar., 1918, p. 289.

[14] Rhoads, Mamm. Pa. & N. J., 1903, p. 157.

[15] Prof. H. E. Hall, personal letter, Jan. 8, 1908.

across over the divide, and down some rill to another river, along which it continues till another landmark, or possibly owner-mark of a rival, warns him that here he must turn and cross by that pond or the old familiar rapid to the point of beginning. Such a beat may take him two weeks to cover and may be 50 miles in length.[16] Possibly such individual has more than one of these routes.

Kennicott credits the Otter with following, not merely a general course but an exact pathway. He says: "In Minnesota, I observed, across a narrow isthmus separating two lakes, a well-worn path which had evidently been formed by Otters; and they seem generally to follow beaten paths when moving on land."[17]

Raymond Thompson, writing from the Northwest, says: "The streams in the regions west of the Rockies and south of the Canadian line do not remain frozen for any length of time; hence, the Otter travels them continually. An Otter's range in such country is very large, and we are satisfied they travel hundreds of miles in making a complete round. As a concrete example, we have known them to leave the Columbia River, and travel up some of its tributaries for at least a hundred miles, returning via the same route. . . .

"In travelling streams that twist about considerably, the Otter is prone to make cut-offs; that is, to travel overland for some distance where it would save him from negotiating horseshoe bends or hairpin curves. . . . And in places where a stream makes junction with another, the Otter will often leave the water and travel overland within the triangle formed."[18]

He then cites cases where, in spite of deep snow, Otter made overland journeys as cut-offs, one of 6 miles, the other of 8 miles.

Manly Hardy, in Maine, corroborates these various accounts. He says: "Otters seldom stay more than a few days in one place, no matter how plentiful the fish are. The Indians say: 'Otter don't happy in Heaven.'

"A family will have a route which they will follow as regularly as a Methodist circuit rider. Sometimes it will be only 15 or 20 miles but oftener twice as much; which round they will make in from 2 to 4 weeks, going through chains of ponds, up or down streams, and sometimes making carries on land for quite long distances, sometimes meeting others, but oftener one party coming into a pond soon after another has left. When

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[16] Mamm. Adir., p. 88.

[17] Quads. Ill., p. 247.

[18] Modern Trapping, p. 212.

one sees tracks of Otters leaving the water and going overland, he may be sure that they are taking the shortest route to some other water."[19]

Numbers and Fur

Its distant relative, the Sea-otter, was at one time found in droves of hundreds; and its still more distant kinsman, the Seal, in swarms of millions. But, so far as known, the Otter was never seen in groups any larger than the family, and is much more often in pairs or alone—here to-day, and gone to-morrow.

Raymond Thompson writes: "The Otter is a rare animal in most parts, and, while found in greater or lesser numbers throughout Canada, is never very plentiful in any one region. . . . . One may travel a hundred miles on a wilderness stream and never see the sign of an Otter; and often when the inexperienced trapper comes across their signs, he will figure there are twice as many Otters as actually exist there."[20]

During the 85 years, 1821 to 1905 inclusive, the Hudson's Bay Company collected 890,901 skins of this species, an average of 10,481 for each year. The lowest was 3,795 in 1829; the highest, 18,100 in 1830. The average for the 10 years, 1895 to 1905, was 8,898.

Poland's lists show that during the 71 years, 1821 to 1891 inclusive, 444,372 skins were taken by the other American companies, an average of 6,258 each year. So that the average annual catch of Otter for fur is about 17,000.

A valuable item on Otter numbers comes from the National Forests of Oregon and Washington. The Rangers have recently made a careful estimate of the fur-bearers there, as follows: Otter, 600; Mink, 18,000; Marten, 1,800; Beaver, 10,000.

This probably represents primitive conditions. The area in question is about 42,000 square miles. It is considered good Otter country, and yet gives us only 1 Otter to 70 square miles.

The Fur Returns in Canada for the 4 seasons 1920–21 to 1923–24 give the Otter catch as follows: 10,931; 13,689; 10,776; 12,962.

Ontario is apparently the best Otter country left in America. In 1923–24, it furnished 5,148 pelts (at the high average value of $34.51 each). The area of the Province is 222,000 square miles. This gives us, in round numbers, 1 Otter caught in every 40 square miles and enough left to perpetuate the species; that is, probably, 4 times as many as were taken. This pre-

[19] The Otter, p. 372.

[20] Modern Trapping, p. 210.

supposes a total population of 1 Otter to 8 square miles; which is probably but little less than primitive proportions.

The total Otter range covers 5,000,000 square miles, and this would give the total Otter population in primitive times at 600,000. To-day it is probably down by at least half. I should rejoice to be assured that we have 300,000 Otters alive in America to-day.

As side-light of several interesting kinds, note the following: In Essex, England, during the fall of 1904, I was reliably informed that 50 Otters were killed, though no one but the Otter hunters suspected their presence. As this 50 was far from exterminating them, there were probably at least 100 Otters in Essex, or 1 to each 16 square miles; and Great Britain, in like ratio, would show a total of 10,000 Otters.

The fur of the Otter is cased. It is one of the best, handsomest, and most durable in the market. No matter how others fluctuate, the price of the Otter is always fairly high. The Winnipeg market quotations for March 26, 1904, were: Prime Otter, $6 to $12. In 1908, $18 to $20. The average price of the Canadian pelts in 1923–24 was $30.70. The record price during the fur boom of 1920 was $105 for the best skins.

The following note by Manly Hardy, for 60 years a hunter and trader in Maine, is of value: "Often the fur of Otters taken in the winter, has the long outer hairs curled or kinked at the end like card teeth. This is called 'sun curl' by the fur buyers, and is supposed to be caused by the reflection of the sun from the ice. Yet this hardly seems a satisfactory explanation, as I have seen them as badly curled early in December, as at any time late in the winter; but I have never seen one taken after the ice was out that was so curled."[21]

Food

This animal is preëminently a fish-eater, yet at times varies its diet in many ways, feeding on frogs, crayfish, and shellfish. "Crayfish, indeed," says Kennicott, "sometimes form a considerable portion of its food, being taken in the water like the fish. I have observed this to be the case when examining its excrement in Minnesota. . . . I have reason to suppose that it sometimes devours the Muskrats, in the house of which it is occasionally found in the Western prairie lakes and marshes. It would probably eat any flesh when impelled by hunger, but it has never been known to devour vegetables of any kind when in a state of nature."[22]

[21] The Otter, p. 372.

[22] Quads. Ill., p. 247.

Otters are extremely fond of crayfish, but, strange to say, they are not lovers of frogs. After frequent trials, I never could induce either of my pet Otters to eat a frog, although they were by no means slow at killing them. They were always ready for fish, fresh or salt, of any kind, raw or cooked; although they always preferred them alive if possible. When fish was not available, both of them were satisfied with bread and milk, meat or potatoes.

Merriam corroborates the crayfish item, stating: "The numbers of crayfish (*Cambarus*) that the Otter destroys in the course of a summer is almost incredible. The Otter 'sign' that one finds so abundantly about our lakes and streams, on rocks and logs, often consist wholly of fragments of the chitinous exoskeleton of the crustacean. At other times, fish-bones are mingled with the broken crayfish shells. . . . When unable to procure these in sufficient quantity, it devours frogs; and is said to depopulate the poultry yard, and even to prey upon lambs. . . . In confinement, it will eat meat, and is said to prefer it boiled."[23]

As an item on the list, several trappers have assured me that Otters commonly feed on fresh-water clams, crushing the shells with their teeth to get at them.

It is known to eat wild fowl; and doubtless, when pinched, will relish a kind of animal food.

W. P. Lett, on the occasion of his paper before the Ottawa Field Naturalist Club, referred to the Otter preying on ducks. Mr. Whitcher, in reply, "stated that he had seen an Otter come up and sit on the rocks alongside of ducks; and that the birds did not apparently mind him, although the appearance of a Mink would have made them all fly. Possibly this was because the Otter seizes his prey from beneath the water, and therefore the ducks do not recognize him as an enemy on land; whereas it is there that the Mink attacks them."[24]

In Maine, according to Manly Hardy, the Otter has a long list of foods. "Besides fish," he says, "they often catch Muskrats, and in winter I have known them to entirely depopulate the houses of a large colony of Muskrats. When in a Beaver country, they often kill the young Beaver, and I feel quite sure that they also sometimes kill ducks.

"I was once being paddled up to a black duck which we had heard quacking in a logan; I saw what I thought were the backs of several ducks, and beyond them, just then a duck gave a loud quack and flew. I then saw that what I had taken for ducks were two Otters which seemed to be trying to catch the farthest duck. While they were under water, I put a

[23] Mamm. Adir., pp. 87–88.

[24] Can. Otter, p. 188.

charge of BBs in one barrel, and on their rising with their heads close together, I killed one and wounded the other. The same fall, the man who was paddling me on this occasion, saw two Otter trying to catch some wood ducks."[25]

As a Fisherman

All of these, however, must be considered mere accidental variations, or emergency rations, on its real bill of fare, for nine tenths at least of its food the year round, is undoubtedly fish—the finest and freshest at that; not mud-cats, swinish carp, or logy suckers, but the sweetest and swiftest of all—the superb trout and the regal salmon.

The Otter is *the* fisherman *par excellence:* it is the successful fisherman, and therefore it is the hated of all other fishermen.

W. P. Lett, who knew the Otter so well, both wild and tame, tells us that "in the pursuit of fish for food, the Otter does not depend entirely upon its extraordinary speed; nor does it always catch its prey by what might be called a tail-on-end race. It approaches its intended victim from behind with great caution. It stretches itself at full length, as when sliding, and with its short front paws, paddles itself slowly and stealthily along, with its body perfectly motionless, no movement being perceptible but the gentle action of its short fore legs. When within about 18 inches of its unsuspecting quarry, the pursuer arches up its back, like the bending of a bow, and, with the speed of an arrow, darts upon its victim, seldom failing to seize and secure it at the first plunge. Should it fail in the first attempt, providing the water is clear, the chase is continued, very generally with success. Otters are very destructive to fish. When abundant in a stream, they eat a small portion only of each one caught; but when scarce and difficult to find they usually devour the entire body. A full-grown Otter is quite capable of catching and killing a fish 20 pounds and upwards in weight, either pike, maskinonge or salmon; but I am inclined to the belief that it prefers fish of a smaller and more manageable size."[26]

Manly Hardy, after 60 years' acquaintance with these creatures, lauds their marvellous speed, and maintains that "they will catch any fish we have, by chasing it as a Cat does a Mouse. . . .

"A friend of mine, while fishing in a pool just below a small fall, saw several large trout come rushing over the fall, and almost at the same time he saw something which, as he said, looked like a shadow, pursuing them

[25] The Otter, p. 371.

[26] Can. Otter, pp. 182–83.

round the pool, and an instant after, an Otter raised his head with one of the trout in his mouth."[27]

An observant but anonymous writer in *Forest & Stream*[28] writes from Packerville, Conn., questioning this statement. He says: "It may be that fish are sometimes caught in a fair chase by an Otter, but I believe far more are caught after the fish has tried to hide in the weeds, mud, under the bank or a stone. Every angler has seen fish in clear water, frightened at his approach, trying to find a place to hide in safety, and of course they would do the same with so great an enemy as an Otter after them."

Hardy continues: "While they feed on trout where trout are plentiful, Otters also eat all kinds of coarser fish—chubs, suckers, and horned pouts. I have several times seen them eating eels, which they seem to prefer to anything else. Sometimes when fish are plentiful and easy to catch, the Otter will kill them for sport, just as too many of our visiting fishermen do. I have known one to pile up a large lot of suckers which he had caught for the fun of it."[29]

Richardson states that "in the spring of 1826, at Great Bear Lake, the Otters frequently robbed our nets, which were set under the ice, at a distance of a few yards from open water. They generally carried off the heads of the fish, and left the bodies sticking in the nets."[30]

Hibernation of the Otter

The annual disappearance of the Otter has long been a puzzle to naturalists. Each year, as soon as hard frost sets in—that is, December in the south fur countries—the Otter, which up to that time were taken occasionally in steel traps, seem wholly to disappear.

Richardson was of the opinion that "in the winter season, it frequents rapids and falls, to have the advantage of open water; and when its usual haunts are frozen over, it will travel to a great distance through the snow in search of a rapid that has resisted the severity of the weather."[31]

This explanation, unfortunately, is contradicted by the fact that there is no concentration of Otters at the rapids in early winter. Such a concentration should be more marked as the frost claims more and more of the open water; and yet we find no record of any such thing.

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[27] The Otter, p. 371.

[28] April 22, 1911, p. 612.

[29] The Otter, p. 371.

[30] F. B. A., I, p. 58.

[31] F. B. A., I, p. 57.

Otters in Washington Zoo. by E.T.S.

Plate XCVII. Otter – pads & poses.

The real explanation has been pointed out by Raymond Thompson. "During the month of November," he says, "the trapper may have pretty fair luck with Otters; but along in December, they suddenly disappear, and the tyro will be at an absolute loss to account for this disappearance. And then, when the first spring thaw visits the land, Otter signs appear miraculously from nowhere.

"This sudden disappearance of the Otter has led some men to advance the idea of migration to the ocean, and we have actually met trappers who firmly believed the Land and Sea-Otter were one and the same animal. . . .

"But when, after careful investigation, we discovered an occasional sign of the Land Otter in midwinter, the truth dawned upon us. . . .

"The Otter winters along streams where he can be assured of getting fish at any time. In the north country, such streams as the Athabasca and its tributaries freeze over when the cold weather is in full swing; and, except along very swift rapids, there will be no opening to the outside from the watery realm. An Otter might travel for miles without finding an airhole through which he could get back into the water, once he left the river where rapids had kept it from freezing over. . . .

"Now the Otter cannot remain indefinitely beneath the surface of the water. He has dens along the bank, entrances to which are below the point where the ice forms. He enters the long tunnel, say four or five feet below the surface of the water, and ranging back into the bank on an upward slope, finally reaches a point above the water mark, where his burrow has been hollowed out into a cozy den. In the summer time, these dens have entrances from the outside, above the surface; but in severe weather, they are only approached by means of the water entrance, the other being closed to keep out the severe cold.

"One would naturally suppose the Otter would be toughened to any degree of cold, but a study of wild life reveals this fact:

"No animal will come directly from the water out into the frost, at a time when the thermometer would register anything near zero. Water animals are very susceptible to cold at such times. A Mink will travel in the coldest weather at times, but only when he has first been in a place where his coat dries thoroughly from any contact with water. Because the Otter cannot get to the land without first entering the water, he does not leave the latter realm until warm weather again visits the land. On the first warm days of spring, the trapper is more than apt to catch an Otter out on the bank, sunning himself, providing of course he is in an Otter country and knows where to look."[32]

[32] Modern Trapping, p. 212.

PLATE CI.—PHOTOS OF OTTERS, WASHINGTON ZOO

Manly Hardy had undoubtedly more than an inkling of this winter habit in the Otter but he did not set it forth in definite print. He says, however: "In winter, Otters make fishing holes through the quite thick ice, just as Seals do. As their noses are formed so as to shut air-tight, they can swim across large ponds under the ice, just as Beaver or Muskrats do by putting their noses against the ice, and throwing out a bubble, which looks like that in a spirit level, and renewing their breath by drawing it in again. If not disturbed, they can swim any distance in this way; but if driven away from their air-bubble, they soon drown.

"In places where the snow drifts deep over the banks on the edges of streams or ponds, they often have places under the snow banks where they bring out their fish and eat them."[33]

The anonymous writer from Packerville, Conn., points out that the Otter does not blow his bubble against the ice, but when far below; so that the air coming up in many little bubbles is revitalized completely when, against the ice, it lodges again as one bubble.[34]

Speed Afloat

As we have already seen, the Otter in the water is quick enough to catch trout and salmon, to some extent, at least, in open chase. Manly Hardy says: "There are few animals as quick as an Otter. When looking at a person, they will dodge a bullet as quickly as a Seal can. I once fired at one which had his head out of his fishing hole in the ice. The ball struck not 6 inches beyond in the exact range of the centre of the hole, but the Otter had drawn his head down before it struck."[35]

Having had but few opportunities to observe wild Otters, I have gathered other testimony for a gauge on their actual speed. Chief Mitigwab, of Mattawa, once my guide in Quebec, tells me that he has several times tried to overtake Otter while they were swimming in the open lake. Though paddling his best, about 6 miles an hour, he could not lessen the distance between. They swam like leeches, rolling over and under. He considers that there is no creature so quick in the water as an Otter, except, perhaps, a loon. He tells me further that on September 17th, he saw a young one and its mother capture a large speckled trout each, in Magnisipi River, Quebec; and, like all who have seen the Otter afloat, he gives enthusiastic expression to his admiration of its powers. It darts and turns, diving or floating, with speed that none of the river tribes can excel. Not only the glancing trout,

[33] The Otter, p. 372.

[34] Forest & Stream, April 22, 1911, p. 612.

[35] The Otter, p. 371.

but also the lightning-swift salmon, are at its mercy. These it meets fairly and squarely in their chosen grounds, the clearest, coolest swirls and deeps, or the open flood; and, rejoicing in a worthy foe, it beats them at their own game; and glories—we have excellent reason for believing—not less in the noble catch than in the noble sport.

As well as being quick, it is long-winded. A tame one belonging to "Antler" could remain under water for three or four minutes.[36] Merriam says that in this respect, its abilities almost equal those of a loon, and he has known an Otter to swim nearly a quarter of a mile without showing its head above the surface.[37]

We are not surprised to learn that with such a mastery of the flood, "the Otter is not particularly afraid of man so long as he has the protection of the water; and for that reason will often approach voluntarily to within a comparatively short range."[38]

On Snow

On the land, though less at home, it is far from being helpless. All the records show, that in snow-time, it travels great distances across country, and can go so fast that it takes a swift-footed man to overtake it.

The marvellous power of this species to propel itself toboggan-wise over the snow, is something that I was deeply impressed with when a child, in Toronto, about 1873.

A citizen had a tame Otter that I was privileged to watch once or twice. I thought it the most beautiful creature I had ever seen, as it gambolled and dodged about the room in a spirit of good-natured frolic. It was entirely without the sullen ferocity of the Weasels, and when it was allowed to go outdoors, it rolled and tumbled in a snow-drift with evident delight. Sometimes it would run and slide on its breast, with all its legs set backwards. Its progress at these times was singular, and continued for much longer than one might expect from the very slight push it began with. It seemed as though the muscles of the breast and belly were in some way helping it on; possibly the tail also aided with its sculling motion.

Richardson, the great authority on our Northern animals, says, concerning its winter travel overland in search of open water: "If seen and pursued by hunters on these journeys, it will throw itself forward on its belly and slide through the snow for several yards, leaving a deep furrow behind it. This movement is repeated with so much rapidity that even

[36] Forest & Stream, Dec. 11, 1879.

[37] Mamm. Adir., p. 87.

[38] Modern Trapping, p. 248.

a swift runner on snowshoes has much trouble in overtaking it. It also doubles on its track with much cunning, and dives under the snow to elude its pursuers."[39]

These very manœuvres were described to me by Linklater. He has often seen Otter sliding on the level snow, and once when he came on one in the woods, it dived into the drifts, which were deep, and came up 40 or 50 feet away. By doing this again and again, it dodged both the man and the Dog, although the latter was a good one, and the former on snowshoes, till it reached a small lake. Unfortunately for the Otter, this was frozen over, and on the ice, the hunter killed it with a small club. It was a male Otter; and the time about the first of December.

"On the ice," says Merriam, "they proceed by a series of what small boys call 'a run and a slide,' that is, they make several jumps and then slide ahead, flat on their bellies, as far as their impetus and the smoothness of the ice permits; and then do the same thing over again, and so on."[40] I may add that this seems to be their regular mode of progression, whether on land or water, ice or snow. The relationship of this mode of travel to the "Otter slide," described later, is obvious.

The track that the Otter leaves on these occasions is eminently characteristic of the animal—a continuous groove a foot or more wide, with tracks of his padded feet in many places, especially going uphill. Old trappers warn us, however, that both Porcupine and Beaver leave a somewhat similar trail. But both of these end very soon if followed; and in any case, the footmark reveals the creature's identity.

The species is no exception to the rule that no animal can reach the highest development in more than one sphere. It is a king in aquatics, but on land is the least active of the family, except the Sea-otter; and I read with surprise J. G. Millais's statement that the Canada Otter commonly climbs trees.[41]

Like most of the family, this animal is chiefly nocturnal in habits, but can very often be seen hunting in broad daylight. It resembles its kindred also in its tireless activity. I do not think I ever saw an Otter lying still. The nearest to it are those that are busy feeding. When they rest, I do not know.

Sociability and Voice

The sociable instincts of the Otter are far better developed than those of his kin.

[39] F. B. A., I. pp. 57–58.

[40] Mamm. Adir., p. 89.

[41] Mamm. Gt. Br., p. 18.

"While not gregarious in the sense of collecting in large numbers," says Hardy, "still I know of no other of our fur-bearing animals, except the Beaver, which is so seldom seen solitary; and no other, not excepting Squirrels, which spend so much time playing together. Two or three are seen together as commonly as one is seen alone. Often 4 or 5 are seen in company, and I have known of 7.

"When swimming, one is usually in the lead, and the others follow in his wake with short intervals between each; and when their backs roll out of water as they swim, three or four will often look like one body 30 or 40 feet in length. The seeing of several swimming in this manner has undoubtedly given rise to the stories often repeated in our newspapers, of large fresh-water snakes being seen in our lakes. Usually, if the one in the lead sees or smells anything suspicious, he will raise his head and neck a foot or two above the water, looking very much as the head of a large snake would look; and as the others dive when he does, people not used to Otter are not to blame for thinking they have seen an immense snake. The belief is further strengthened by seeing places in flag beds or on marshy points, where it looks as if heavy bodies had been dragged. These places are made by the Otters sliding over them."[42]

The three or four that are often seen together in late summer are the mother and family. But in their curious sport of sliding downhill, we find a veritable social affair, taking in the whole neighbourhood; although some observers consider that in most cases, the game is strictly an affair of the family or of mates.

The species makes a variety of noises. A female in the National Zoo at Washington, obtained in northern New York, often emitted a loud birdy chirp to express inquiry, desire, or hunger. Another female that I was sketching at the same time (April 28), made a low chatter or querulous grumble that seemed to express the same idea. The latter was from Florida.

W. P. Lett says: "They have two notes or tones of voice, one a sort of satisfied grunt, like that of a Pig, the other a shrill half squeal, half whistle. The latter is given short and sharp, and with peculiar vindictiveness of tone when they are enraged."[43]

It utters a loud sniffing that sounds like clearing its nose of water, and it growls and snarls in menace. Manly Hardy adds: "Sometimes when attacked, they give a sharp scream, somewhat like the scream of a Mink,

[42] The Otter, p. 330.

[43] Can. Otter, p. 183.

PLATE XCVIII.—OTTER POSES (FROM LIFE)

only much louder. This and a noise they make when they are calling each other, are the only noises I have ever heard of their making, except that I have heard of one snoring when asleep; and when one rises out of the water and smells a person, he will snort or blow very much as a Seal does."[44]

Its scream, which is referred to as an expression of wrath or defiance, is one of the loudest, farthest-reaching sounds in our woods. It is described as a veritable "hair-lifter."

A captive Otter kept by J. K. MacDonald, of Winnipeg, in 1886, at Bersimis on the Gulf of St. Lawrence, used to utter this scream with such power that my informant repeatedly heard it across the river (a mile and a half away), as plainly, he said, as he could hear a man whistle if in the same room with him. He knew of no other animal sound so shrill save the scream of the eagle or the loon.

Sanitation

In captivity, the Otter is scrupulously clean, dedicating one corner or space to the Sanitation Department, and strictly referring all proper matters to this department.

In the Washington Zoo, I have seen the Otters repair to them most punctiliously, when the biological moment arrived; and having responded to the urge, examine the produce, roll on it, rub cheeks in it, and in various ways indicate that here there was something of importance, probably charged with a musky message. But the details of the message, or its transmission to the next, I did not see demonstrated. Young naturalists will find this a profitable field of inquiry.

In a state of nature, these wise creatures used the social dung-pile as a means of letting those about know "Who's Who." The trapper does not miss the significance of these fragrant letter-boxes, and is guided by them in locating places for his destructive work.

After remarking on numerous examples of Otter slides in the Adirondacks, Doctor Merriam writes also "of their wallowing places, which are either level beds or slight depressions in which they play and roll. May's Lake, a small and secluded body of water abounding in trout, is fairly surrounded by them."[45]

These I have never seen, nor do I find them commented on by other naturalists. Nevertheless, I have seen them among other animals, and suppose that they are of the nature of a dust or mud bath with a distinct bearing on sanitation, possibly to combat insect parasites.

[44] The Otter, p. 330.

[45] Mamm. Adir., p. 89.

In the description of the British Otter's den mention is made of the garbage bin. It would ill harmonize with the rest of the American Otter's record if he did not establish, and scrupulously use, such a convenience.

A Dangerous Fighter

There are few wild animals in America that have not been described by someone as "skulking cowards," however brave they may be in a single fight—so described by men who knew nothing of risk or war-wound. Yet there is one that all men of the woods agree is clear grit, grit to the bone, without a yellow streak, staunch to a finish, a fighter that never shuns a fight, that never surrenders. That one is the subject of this Life.

The Otter is a valiant beast. "When Otters are trapped, where they cannot get into the water," says Manly Hardy, "they will fight a trap terribly, and if they cannot pull out or break the chain, will usually kill themselves in a short time. No one who has not seen it would believe how an Otter can twist the links of a chain which has no swivel in it. I have seen a chain which seemed strong enough to hold a Horse, broken by an Otter. I have twice set traps on Saturday afternoon, and on Monday forenoon have found Otter dead from fighting the trap, which appeared to have been dead for twenty-four hours. When caught on the land, they usually break most of their teeth in fighting the trap. I have several times seen the whole end of the lower jaw broken, and I have had several of the old-fashioned hand-made traps which plainly showed the marks of Otter's teeth on the bedpieces."[46]

As a further commentary on the steel trap, my friend, Anthony W. Dimock, writes me thus from Punta Rassa, Fla.:

"Last year (1905) I held a fiercely struggling Otter crushed into the mud with a forked stick, while the cruel steel trap was taken from her lacerated leg, and a cage placed over her. Two days later, she ate her new-born pups, and in two days more, despite every attention, she died of grief and pain. Now I would make the use of a steel trap a penal offence, and wearing the pelt of a trapped wild creature a misdemeanour."

If its trail is discovered in the winter snow, when evidently the creature is frozen out of its safe refuge, the hunter follows, and within a mile or two he usually gets an opportunity to shoot the portaging voyageur.

However, during its overland or oversnow journey in search of open water, if closely pressed by pursuit, the Otter will turn on any assailant, and defend itself with marvellous courage and power.

Hardy, from his amplitude of experience, writes: "Otters will sometimes

[46] The Otter, p. 371.

whip a large Dog in a fair fight. I know of one case where there was a large bulldog with a lumber crew. The landing sawyers heard him all the afternoon, barking down near the outlet of the pond; and as he did not come at night, they went in search of him with a lantern. They found him lying between a dead Otter and the Otter's hole. He had killed the Otter, but was himself too badly hurt to move."

As offset to this: "Once, my father, when hunting Moose, found the tracks of three Otters which were crossing over high land in making a short cut from one pond to another. His companion had with him a quite small Dog which had been trained to kill animals in traps by backing up to them and letting them jump on his back, when he would wheel, and catch them by the throat. In this case, on coming to the Otter, the one he attacked rose on his hind feet and jumped on the Dog's back. The first two times the Dog got the Otter by the throat, he was thrown several feet to one side; but the third time, he held his grip, and did not let go till the Otter was dead.

. . . . . .

"In another case my old friend, William H. Staples, was crossing some burned land when there was snow, and came upon the tracks of three Otters. He had with him a large bulldog which took the track, and when Staples came up, the Dog had one of the Otters dead. I came into the Seboois House only a few minutes after Staples came in with the skin. The Dog showed no signs of being bitten. If there was any fight, it must have been a very short one, as the first Staples knew of it was finding the Dog with the dead Otter."[47]

This is all the evidence I can find in disparagement of the Otter's valiancy. My critical comment is that in each case, the Dog was two or three times the weight of the Otter. The Otter knew of the presence of the men and the need for escape, and was by that much handicapped; while by that same, the Dog was morally backed up and encouraged. Finally, it was on land. Had it been in the water or in a swamp, or had the affair been afar in the wilderness, with no one present but Dog and Otter, the ending would have been of a totally different kind. I am still of the opinion that no Dog ever conquered an Otter in fair single fight.

Hardy follows these Dog episodes with another, which should have reinstated the Otter in his esteem. He writes:

"In one case, I knew of three Otters making common cause and beating a man. Two men, with both of whom I was well acquainted, were Deer

[47] The Otter, p. 330.

hunting, and were travelling parallel with each other, and not far apart. One of them, called Crooked-Eyed Joe Penney, came upon three Otters, and fired on and wounded one. The Otter fell, and Penney, who had a single-shot muzzle-loader, rushed up to get him, when the others attacked him. He broke the stock of his rifle and bent the barrel in trying to kill them, with the result that he was badly bitten, and his trousers nearly torn off, while the Otters, including the wounded one, escaped."[48]

Otter hunters in Europe tell me that such is the power of its bite that it is not a rare thing for an Otter to crush a hound's leg bone in its jaws.

The most desperate achievement accredited to this animal, appears in Nelson's "Alaska": "An Otter," he says, "was one of the chief actors in a strange accident which occurred near the Yukon mouth during my residence in the North. A hunter went out to inspect his fish traps, and, failing to return in the course of a day or two, his friends began to look for him. He was found lying dead by the side of a small lake with his throat torn open and the tail of a dead Otter firmly grasped in both hands. One of the Otter's feet was fast in a steel Fox trap, and it was supposed that on his way home, the hunter came across the Otter in the trap and, having no weapon with him, and being a powerful young man, he tried to swing the Otter over his head and kill it by dashing it against the ground, but when in midair, it turned suddenly and caught him by the throat, with the result as described."[49]

Enos A. Mills, out of the richness of his experience, describes the Otter as a creature fearing none in open onset. He says:

"The Otter is a fighter. One day I came upon records in the snow far from the water, that showed he had walked into a Wild-cat ambush. The extensively trampled snow told that the desperate contest had been a long one. The Cat was left dead, and the Otter had left two pressed and bloody spaces in the snow where he had stopped to dress his wounds on the way to the river. On another occasion, the fierceness of the Otter was attested to by two Coyotes that nearly ran over me in their flight after an assault on the rear guard of a band of overland Otter emigrants.

"Probably the only animal that enters a Beaver pond, that gives the Beaver any concern, is the Otter. One morning I had glimpses of a battle in a Beaver pond between a large invading Otter and numerous home-defense Beavers. Most of the fighting was under water, but the pond was roiled and agitated over a long stretch, beginning where the attack com-

[48] The Otter, p. 331.

[49] Nat. Hist. Coll. Alaska, 1887, pp. 250–51.

menced, and extending to the incoming brook, where the badly wounded Otter made his escape. . . .

"Several times, during this struggle, the contestants came up where they could breathe. Twice when the Otter appeared, he was at it with one large Beaver; another time, he was surrounded by several, one or more of which had their teeth in him. When he broke away, he was being vigorously mauled by a single Beaver, which appeared content to let him go, since the Otter was bent on escape. It was an achievement for the Otter to have held his own against such odds. The Beaver is at home in the water, and, moreover, has terrible teeth and is a master in using them."[50]

Toward Dogs

William P. Lett, of Ottawa, describing his pet Otters, says: "They are singularly fond of playing with Dogs, more especially with water spaniels, with which animals they delight to frolic in the water. . . .

"When a tame Otter meets with a strange Dog, it advances quietly and insinuatingly towards it, with a singular serpent-like motion of the head and neck. When close enough, the Otter endeavours to smell the nose of the stranger. If the Dog undergoes this operation quietly for half a minute, it is conquered, and immediately transformed into a friend, no matter how hostile or uncertain its first intentions may have been."[51]

Merriam says: "At all times and on all occasions, they manifest an insatiable and uncontrollable desire to break the peace with any Dog that chances to cross their path—and woe be to the unfortunate brute."[52]

Next, we have Miss Moore-Willson, writing of a family of pet Otters in Florida: "They played about the house with the Dogs, were petted by the children, and indulged in all sorts of cunning antics. . . .

"Frequently they would wander to the field back of the house, and when their owner thought it time for them to come home, he would send his Dogs after them—Otters and Dogs playing along the way as they returned. Were any strange Dogs to attack the home Dogs, the Otters rushed right into the fight, making the bravest allies."[53]

Of these conflicting testimonies, the simplest explanation is individual variation.

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[50] Watched, pp. 66–67.

[51] Can. Otter, p. 183.

[52] Mamm. Adir., p. 90.

[53] Otter Pets, p. 84.

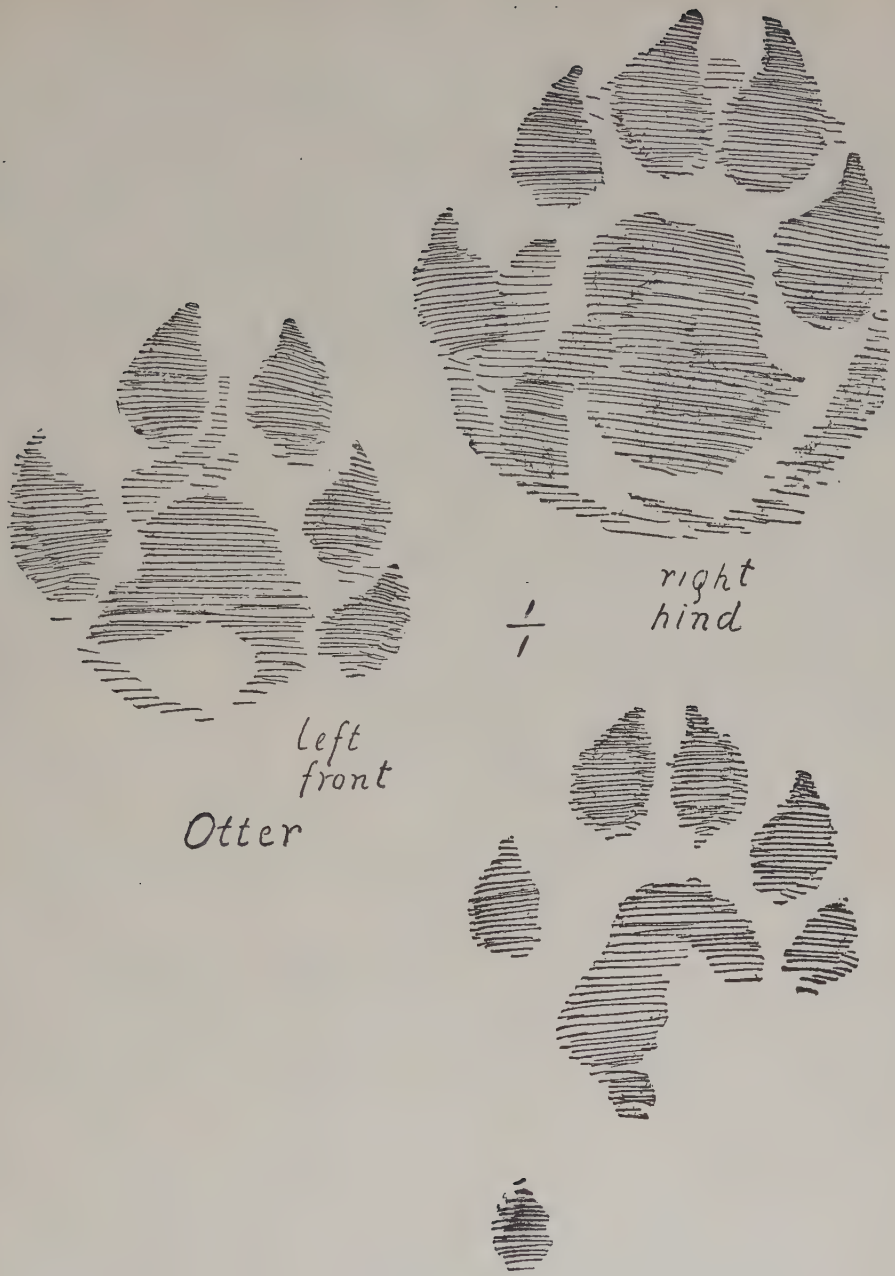

PLATE XCIX.—OTTER TRACKS, FROM CAGED SPECIMEN IN WASHINGTON ZOO

Mating, Den, and Young

Most observers agree that the species pairs, and that the mating season is toward the end of February.

The British Otters bred in captivity by A. H. Cocks, gave an admirable opportunity for observation. The female showed that she was willing to consider a proposal of marriage, by leaving little piles of well-mouthed straw here and there in the cage. I suspect also by dropping at the dung-piles some contribution that was leavened with informative musk. In a state of nature, these straws would be left at convenient spots along the banks of the river, or other main line of travel.

The male showed none of the savage ferocity of the male Marten. His behaviour, in general, was irreproachable.

Kennicott tells us: "It digs a burrow on the bank at the edge of the stream or lake, with the entrance under water, like that of a Muskrat. Its burrow is not so extensive, however, as that of the latter animal, and it never constructs a house of any kind. In a capacious chamber in its burrow, it forms a large soft nest of sticks, leaves, and grass; though sometimes it has been observed to take up its quarters in the bottom of a standing hollow tree, or in a cavity in a fallen one."[54]

W. P. Lett's description is more detailed. He says: "The Otter usually burrows in the banks of streams, or, if not, appropriates the already excavated den of the Muskrat. The entrance to its den from the side of the river, creek, or lake, is always under water. About three or four feet inwards from the external or lower entrance, the hole inclines upwards to a sufficient height for the formation of a dry nest to sleep in. From the sleeping place, an opening is made obliquely through the top of the bank, for the double purpose of admitting air and of allowing the passage of the animal in that direction. Advantage is constantly taken of this upper and second mode of exit, which is sometimes concealed by fallen leaves, for the purpose of looking out in order to be certain that no enemies are near."[55]

S. N. Rhoads describes one of these dens that he examined in Pennsylvania. It was of the same general plan, but much larger, with longer tunnels, and had evidently been in use for generations.[56] The tunnels were 10 inches in diameter, though in some parts twice as much, and 40 and 60

[54] Quads. Ill., p. 247.

[55] Can. Otter, p. 181.

[56] Mamm. Pa. & N. J., 1903, pp. 159–61.

feet in length. The chamber was about 6 feet long and 3 feet high. There was another chamber much larger, but it was destroyed before being properly examined.

This Otter earth was in a high clay bluff by the water. It was evidently very old, and "it had originally been dug (probably hundreds of years ago) from the bottom of the creek."

Hardy tells of trailing a three-legged Otter to her den, and found her "in a hollow log with two young. She had a nest made of shredded cedar bark. I have known of their having dens in ledges, but this is the only instance I know of one's denning in a log."[57]

A wholly different habit is imposed where there are no high banks in which to burrow; thus, among the low marshes of Florida, the only cover is brakes and thick vegetation.

"Here the female builds her nest," says Miss Moore-Willson, "so cunningly devised that an old trapper might pass it by many times without any suspicion of its location. A hunter who captured a nest of three young Otters describes it as being built in the shape of an Indian shack made of tall marsh lilies, and so dexterously woven and closed at the top as completely to conceal the occupants within. The inside of the nest was lined with leaves and grasses, from which snug retreat the baby Otters were taken, they to partake of a life of civilization and its consequent sorrows, the mother to go through a period of mourning for the loss of her young."[58]

The gestation of the British species was ascertained by A. H. Cocks to be 61 days. No doubt the period will be found about the same in *canadensis*.

The young are born in mid-April, or sometimes as late as May 1st. They usually number 1 to 3.

Manly Hardy says: "Usually Otters have but 2 young, but I have known of their having 3. Some writers speak of more, but I very much doubt their having more than 3."[59]

Nevertheless, William R. Hine, of Winnipeg, assures me that in a female taken at Brokenhead, he found 5 well-developed young. These were the size of a small Striped Ground-squirrel, and must have been near full time, as it was late in April.

At birth, and for some weeks afterward, their eyes are closed. Their colour is said to be very dark brown, almost black.

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[57] The Otter, p. 372.

[58] Otter Pets, p. 84.

[59] The Otter, p. 372.

Family Life

If our nature novelists wish to have a subject in which they may revel in romance and affection, mother love and devotion, without let or limit, they will be on perfectly safe ground if they select the Otter, and depict an ideal, loving family life. To this view we have the name subscribed of every hunter-naturalist who has gone on the record.

The father is present, if not dominant, in this pleasant picture. His greater strength and fighting form are ever at the service of his brood, and the many cases on record where the mother only was seen with the young, are as easily explained as among ourselves.

Mills tells thus of those he knew in the Rockies: "Relentless in chase for food, and fierce in defense of self or young, yet he is affectionate at home, and playful with his fellows.

"Both parents carry food for the young, and both appear devoted to them. As soon as they are allowed to romp or sleep in the sunshine, they are under the ever-watchful eye of one of the parents. Woe to the accidental intruder who comes too close. A hawk or owl is warned off with far-reaching snarls and hisses. If high water, landslides, or the near presence of man threatens the youngsters, they are carried, one at a time, to a far-off den. . . . If an old one is trapped, or shot, the mate seeks the absent one, wandering, and occasionally wailing, for days. Perhaps they mate for life."[60]

Training of the Young

Much discussion has taken place over the question whether or not animals train their young. It seems as though in very ancient forms, retaining primitive habits, the young need little or no instruction from parents. Thus, an incubator duck will take to the water, or snap at a fly, when but a day old. On the other hand, those animals with highly specialized habits, are slow to learn, and need some sort of stimulus. The young hawk or Weasel speedily learns to seize a bird, but the young osprey and Otter have departed farther from the ancient way, and are more in need of teaching. Whether this be conscious or unconscious on the part of the parents depends on our definition of these terms.

An interesting picture of their nursery life has been given by J. G. Millais, who studied Otter in Canada and in England, though, unfortunately, he omits the dates and places that would have added so much to the value of his remarks. His account, no doubt, refers chiefly to the British Otter,

[60] Watched, p. 69.

but it is almost certain to be found applicable in the main to our own species, when fuller observation shall have enlightened us on the early history of the young.

"As soon," he says, "as they can see, the mother Otter takes her cubs to the water and teaches them to swim. At first, they are said to be very reluctant to enter the water, and as a preliminary training, she often makes an exit hole upon the bank above her holt, where she allows them to play and run about for a few days, before enticing them to mount on her back and embark on a voyage of discovery. For the first few days in the water, she swims with them, but soon dives and returns to them again and again, until she has induced them to copy her movements."[61]

Mills offers a note on one item of the training, thus: "They may singly, or sometimes two at a time, ride on mother's back, as she swims about low in the water. When they are a little older, mother slips from under them, much to their fright and excitement. She thus forces them to learn to swim. Though most habits are likely instinctive, they are trained in swimming."[62]

Millais continues: "In their preliminary efforts at natation, young Otters are just as frightened as they can be, and keep querulously calling for their mother all the time she is out of sight. But, at first, she does not upset their baby natures, and only vanishes for a few minutes. As the young grow, these intervals become longer and longer, till she induces them to follow her in shallow water, or in a still lake. I once had the good fortune to see an old female Otter playing with her three nearly full-grown young ones, and evidently teaching them to dive.

"She teaches them to dive noiselessly, to circle in deep pools, and how to come up quietly behind sleeping fish, or drive them into holes in the banks. Then they are taught to stir the mud with their pads, or turn over stones for hidden miller's-thumbs, and bury their heads in the mud after eels, or how to corner the darting salmon.

"That the swimming powers and the hunting of fish, are acquired habits is shown by the fact that young Otters, kept tame and allowed to run loose, are almost full grown before they will take to the water; they grow up with Stoat-like habits, i. e., hunting for their food on land."[63]

A. H. Cocks says of those (British) he bred in confinement, that the young were blind until about 35 days old, and entered the water of their own accord, on the 58th day. He gives a suggestive account of the mother's efforts to make them eat two small fish, some four days later, "taking first

[61] Mamm. Gt. Br., pp. 19–20.

[62] Watched, p. 70.

[63] Mamm. Gt. Br., p. 20.

one fish, then the other, then both together in her mouth, and moving them about close in front of the cubs, to attract their attention, at the same time uttering a peculiar whine or growl."[64]

Summer Time

During the summer, the Otter family, mother and young, may be seen travelling and hunting together. A glimpse of their life at this time, was secured by Bert A. Dobson, of the Adirondacks.

In early June of 1900, while fishing on Peavine Creek (Cranberry Lake), he saw a female Otter and two kits, one third grown. She uttered a loud chirruping, and, dashing down the creek, which was not deep enough for swimming, she led the young off, chirruping and clucking to them like a hen.

In Algoma, the young are seen with the mother in June, July, August, September, October, November, and December, but usually only one parent is near. Linklater, my chief informant in that region, has known the mother and 3 young to be killed at one shot, in September [when the pelts were useless and the young probably assembled to nurse. Such brutality!].

Another fragment for our mosaic is furnished by the vigorous Manly Hardy. He says: "The well-known guide, T. W. Billings, of Brownville, Me., once told me that one time he was crossing a bog to look at an Otter trap, when he met an old Otter and 2 young ones. He tried to kill one of the young ones by jumping on it, when the old one attacked him, and as he said, made him take steps that a dancing master would never have taught him. He finally killed one of the young ones, but was badly bitten."[65]

Probably they are not weaned till 4 months old; and at 9 months, they are fully grown.

But one brood is reared each year.

The Father Otter

It is always important to know the relation that the father bears to the family. Is he merely a selfish progenitor, concerned about his partner or partners only in the mating season? Or, does he faithfully play the part of a helpmate and join with the mother in caring for the young?

As we have seen, Mills believes that they pair for life. Most observers think that the species pairs, that is to say, is not polygamous, but that the bond is broken with the waning of the honeymoon. Miles Spencer expressly says that, about Hudson Bay, the female gets no assistance from the

[64] Zoologist, 1882, p. 203.

[65] The Otter, p. 331.

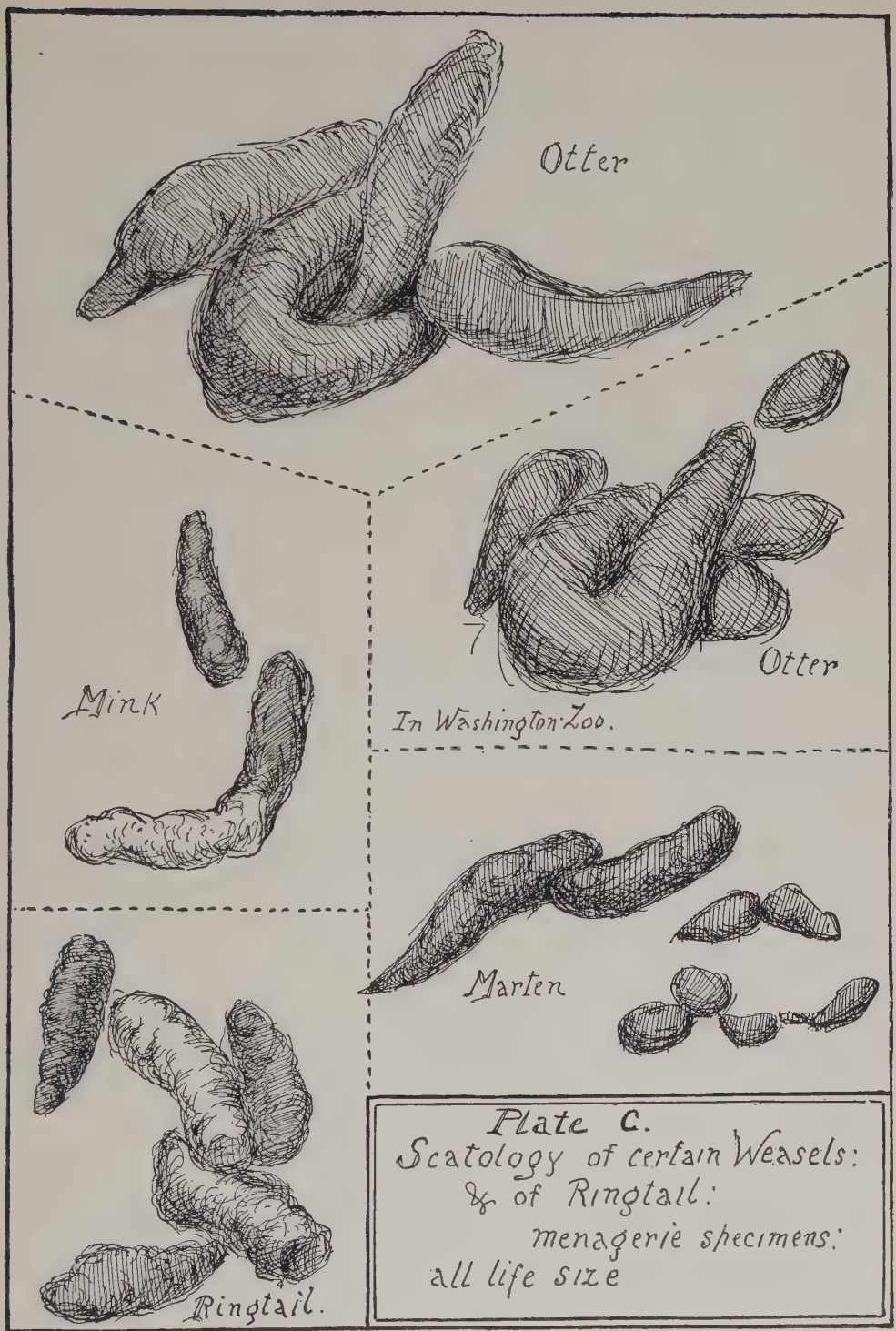

Plate C.
Scatology of certain Weasels:
& of Ringtail:
menagerie specimens:
all life size

male while rearing the young.[66] Other field naturalists think that the male does sometimes join in caring for his offspring. J. K. MacDonald, of Winnipeg, after many years among the Hudson's Bay Company Posts, writes me: "I do not think the male is ever far away from his hole or family. The fact that the female is seen with the young more often than the male, I think, simply carries out the natural law of progeny being more directly under the care of the female; while the male roams about, but never is far away. In the cases cited of females only being seen, there is nothing to disprove that the males, though not visible to the seer, may have been within a few yards of him."

On September 27, 1905, George Crawford, the Mattawa guide, came to my camp at a place 40 miles northeast of Mattawa, and told of 4 Otter that he had watched the day before, on one of the small lakes near by. They were 2 old ones and 2 young ones. He was quite sure that 2 were fully grown. In October of the previous year, Archie Miller saw 2 adults and 5 young together at Blue Lake, Quebec. This looks as though the father did sometimes accompany the family.

Bellalise, my Indian guide in the Northwest, told me that he had seen 5 Otters together on the Athabaska River about Nov. 15th. Since 3 is the usual limit of young ones, the father was probably one of the group.

Nelson, in his "Natural History of Alaska," says also: "Toward the end of the winter, they frequently make a burrow in a large snowdrift, and sometimes a party of 5 or 6 will be found occupying the place. Such parties usually consist of the 2 old ones and the last season's young."[67]

Thus, there is some evidence that the male Otter does not entirely neglect the duties of paternity, though there can be no doubt that the mother has the heavier burden, and sometimes bears it alone. The young continue in her care until the winter; probably the bond is broken by the coming on of the new mating season in February.

The Merry-making Otter

I rejoice more in glimpses of my animal's personality, its mode of thought, and way of life, than I do in details of its skull, or dates of its appearance. For these are the glimpses of the little mind within.

The Otter's life is full of reward. The endless playfulness of the creature is dwelt upon by those who know him well.

At all ages, Otters are playful animals. They chase each other in tire-

[66] Low, Expl. James Bay, Can. Geol. Surv., 1888, J, App. III, p. 77 J.

[67] Alaska, 1887, p. 250.

less games of tag, and sport and roll in the water like Porpoises. If caught young, they are readily reared, and become the most fascinating of pets. It has been my luck to meet with two or three tame Otters, and in each case, I was left with a profound admiration for the grace and playfulness of this exquisitely beautiful creature.

On watching a gambolling Fox cub, a fawn, an Ocelot, a Marten, or even a well-furred pet Skunk, one is apt to be carried away and declare each in turn the most beautiful and graceful creature ever seen. But when all are gone from view, when nothing but the dim impression remains, it is the Otter that stands out preëminently as the most beautiful and engaging of all elegant pets. There seems no end to its fun, its energy, its drollery, its good-nature, and its postures of new and surprising grace. I never yet saw one without shamefully infringing Article X of the Decalogue.

J. K. MacDonald writes me: "They make delightful pets. A tame Otter at York Factory, Hudson Bay, in 1871, used to lie about the Fort among the Dogs. On first living among them, several of them tried issue with him, only to find that he left souvenirs of the struggle on their legs, etc. The remaining Dogs, benefiting by the experience of their friends, made no further attack on him; and so he moved around among them quite nonchalantly. He used to take long swims in the river, both to enjoy the pleasure of swimming, and get some fresh fish of his own killing. He always returned, and slept inside the Fort pickets. No doubt, at the mating season, he would have left, if at large. This we were not permitted to prove, as a strange Indian, arriving close to the Fort, saw what he thought was a wild Otter, and so he shot it."

Merriam says: "In growing old, however, they are apt to become ugly, and have been known to bite those who attempt to play with them."[68]

Minnie Moore-Willson, an enthusiast on Otters, writes from Kissimmee, Fla., concerning her two pets, as follows:

"Scarcely possible would it be to find a more playful animal than the Otter; he is never still except when asleep, but is ever rolling, tumbling, or chasing some moving object. Occasionally, this rollicking pair have been allowed to come into the house, when the spirit of discovery has displayed itself strongly. Curtains and rugs would be investigated, and buckets and pans thoroughly examined. Their love for bright objects was one of the first characteristics observed. A silver dollar was a delight; picking it up in his mouth, the one would carry it away, the other closely following until a quiet nook was reached. Lying on his back, with the silver piece upheld by the fore paws, he would chirp and chatter over it like a playful child,

[68] Mamm. Adir., p. 90.

the mate dodging and tumbling, awaiting her turn at the coveted plaything."[69]

Enos A. Mills, as charming contribution to the subject of the Otter and his playthings, says: "One day, an Otter, in passing hurriedly, rattled gravel against a discarded sardine can. He gave three or four frightened leaps, then turned to look back. He wondered what it was. With circling, cautious advances, he slowly approached, and touched the can. It was harmless—and useful. He cuffed it, and chased it; he played with it as a kitten plays with a ball. Presently he was joined in the play by another. For several minutes, they battered it about, fell upon it, raced for it, and strove to be the first to reach it."[70]

In the Washington Zoo now is an admirable demonstration. Jenny, the old Otter, plays for hours with a flat stone, throwing it into the water, diving after it, swimming with it poised on her forehead. Having adopted apparatus, she is in the highest class of play-makers.

The Otter Slide

The use of appliances for games is found among several of the higher animals, but seems to find its climax in the Otter; for, in addition to apparatus, he has a performing place—the famous Otter slide, or toboggan shoot.

All hunters and naturalists in Eastern America record its singular amusement of coasting or tobogganing for 20, 30, or even 40 feet down a steep hill, preferably into the water; to remount at once and repeat the performance again and again, in company, perhaps, with its mate or young.

It is delightful proof of growth and uplift when we find an adult animal setting aside a portion of its time and effort for amusement, and especially for social amusement. A large number of the noblest animals thus relax from sordid life, and pursue recreatio with times and appliances after a fashion that finds its highest development in man. This is what the Otter is credited with doing, but there are naturalists who do not consider it proven. Therefore, I give evidence.

"The Otter is very fond of play," says Hearne, "and one of their favourite pastimes is to get on a high ridge of snow, bend their fore feet backward, and slide down the side of it, sometimes to the distance of 20 yards."[71]

"In the summer," says Godman, "this amusement is obtained by selecting a spot where the river bank is sloping, has a clayey soil, and the water at its base is of a considerable depth. The Otters then remove from

[69] Otter Pets, p. 84.

[70] Watched, p. 68.

[71] Journey, p. 376.

the surface, for the breadth of several feet, the sticks, roots, stones, and other obstructions, and render the surface as level as possible. They climb up the bank at a less precipitous spot and, starting from the top, slip with velocity over the inclining ground, and plump into the water to a depth proportioned to their weight and rapidity of motion. After a few slides and plunges, the surface of the clay becomes very smooth and slippery, and the rapid succession of the sliders shows how much these animals are delighted by the game, as well as how capable they are of performing actions which have no other object than that of pleasure or divers on."[72]

"This statement," says Bachman, "is confirmed by . . . recent writers, who have given the history of this species, and is in accordance with our own personal observations.

"The Otters ascend a bank at a place suitable for their diversion, and sometimes where it is very steep, so that they are obliged to make quite an effort to gain the top; they slide down in rapid succession where there are many at a sliding place. On one occasion, we were resting ourself on the bank of Canoe Creek, a small stream near Henderson, which empties into the Ohio, when a pair of Otters made their appearance, and, not observing our proximity, began to enjoy their sliding pastime. They glided down the soaplike muddy surface of the slide with the rapidity of an arrow from a bow, and we counted each one making 22 slides before we disturbed their sportive occupation.

"This habit of the Otter of sliding down from elevated places to the borders of streams, is not confined to cold countries, or to slides on the snow or ice, but is pursued in the Southern States, where the earth is seldom covered with snow, or the waters frozen over. Along the reserve dams of the ricefields of Carolina and Georgia, these slides are very common. From the fact that this occurs in most cases during the winter, about the period of the rutting season, we are inclined to the belief that this propensity may be traced to those instincts which lead the sexes to their periodical associations."[73]

Similar testimony is supplied by my Adirondack guide, Bert A. Dobson. One day in September, he was hunting Deer near Cranberry Lake, N. Y., and heard a loud splashing. On crawling near, he saw 3 Otter (mother and 2 young) shooting down a slide into the water They did it two or three times each before they smelt him and dashed into a hole.

Archie Miller, guide, from Mattawa, says that he has seen hundreds of these slides, and, as late as October, 1904, he watched a family of Otters

[72] Am. Nat. Hist., 1826, I, p. 226.

[73] Q. N. A., II, p. 8.

at their slide at Blue Lake, 40 miles northeast of Mattawa. These were 2 old and 5 young ones. They slid down, rapidly climbing up again to slide down as before, for a full hour.

Chief Mitigwab, after spending a lifetime in Otter country, and seeing many Otter, says that they slide all the year round, for amusement; usually, but not always, at special places, most in the snow, during spring and fall. Archie Miller corroborates this in every detail.

At Swan Lake, Man., James M. Macoun saw slides that were in use during August. J. G. Millais counted no fewer than 6 on one quiet brook flowing into St. John's Lake at the head of the Terra Nova River, Newfoundland, and says: "All the slides I have examined in Newfoundland had been freshly used and were polished smooth, with the grass and moss all worn away, showing that they had been in constant use all the summer."[74]

One of the best descriptions of a sliding party is by Enos A. Mills. He saw 14 together, engaged in the pastime. The affair is fully set forth in his "Watched by Wild Animals," and is too long for quoting *in extenso*.

Cartwright, Godman, Kennicott, Rhoads—all offer corroborative testimony. Each new scrap of evidence shows the sport further removed from the influence of sex and season. And sport the exercise is—just as surely as is that of the small boy who drags his sled to the top of a hill for the pleasure of shooting down again, of having the delicious sensation of speed without effort. Whether the Otter slides from the top of a mere snowdrift into the adjoining hollow, or down a muddy bank into a stream, or, best of all, down a long, icy hill, to plunge into deep, cool water below, it is evidently done for sport, for the joy of feeling itself flying through space without labour and without violence; and with the very same exhilaration that such a thing would give to mankind. To this, the creature fails not to add the crowning charms of good company and of friendly rivalry, for, so far as I can learn, no one has ever yet seen an Otter enjoying its slide alone.

It is the rule for *young* animals to play together, and occasionally the full grown will indulge in a good-natured sham fight or a chase, for sport. But this is the only case I know of, among American quadrupeds, where the entire race, young and old, unite to keep up an institution that is not connected in any way with the instincts of feeding, fighting, or multiplying, but is simply maintained as an amusement.

Thus, the case of the Otter in Eastern America has been fully set forth; but it is a remarkable fact that Sir John Richardson, who lived for years in the Great Lone Land, says not a word about the Otter's toboggan slides,

[74] Mamm. Gt. Br., p. 21.

though he describes its habits at length. Hearne's remarks I have quoted, but I can find no other hunter northwest of Lake Nipissing, who has ever seen an Otter sliding for amusement; while I find many reliable naturalists of the Northwest, notably Roderick MacFarlane, who have but little faith in it.

His Goodness

It is always puzzling to hear a nation of sportsmen laud the hunting and harrying of an Otter by 50 huge Dogs. Sport, good sport, they call it; though the Otter has not the ghost of a chance, except, perhaps, to escape for that day. And these same good folk, blind folk, will froth at the mouth over the bullfights of Spain, in which fights the bull has at least a chance to kill some of his assailants—and commonly does. Is it because the unfailing grit of the Otter has in some measure glorified the sport, and the fact that he *may* get away has justified it?

This is a heavy penalty on courage, and brave in fight is he, as we have seen. Yet Manly Hardy says: "While most animals occasionally quarrel with each other, I have never heard of Otters being seen fighting together, and in handling some thousands of their skins, I have never seen any evidence of their biting one another."[75]

Mrs. Moore-Willson, writing of her two pet Otters in Florida, says: "The jealousy in the nature of these wild animals was always apparent when there was the slightest provocation for it. With each other, it was as with two generous-hearted children, not an objection to the one being petted, but the manifest desire, 'love me, too.' When one was being fondled, with a quickness that was surprising, came the coaxing and pleading from the other for a similar attention. . . . Their devotion to each other was indeed touching. When the one received a whipping for some offense, the mate sat by, crying pitifully, apparently much more affected than the culprit who was receiving the punishment."

. . . . . .

Then arrived the shock of bereavement. "A night came, however, when the gentler one took sick and died. The living one soon realized that something wrong had happened, and tried to arouse the mate by caressing and licking the body. Finding this of no avail, he left the bed, and no amount of coaxing would induce him to return to it.

"All day long following the death of little Juliet, the male called and cried; and when night came, his sorrow grew intense. The scene was a

[75] The Otter, p. 371.

simple one—a tropical yard, dimly shadowed, and a half-grown Otter in the foreground—nothing more; but the pathos in that 'chirp, chirp,' as he hunted for the mate that never would answer, was an exquisite pain to the bystanders. . . .

"As the little Otter silently wandered from one side of the wire-netted fence to the other, every fibre of his little body was tense with earnest listening. Standing erect, with his fore paws holding on to the netting, he would peer out into the night, startled at every quiver of a leaf. Moving a few steps, as if bewildered, he would seek the open space in the yard; and rising on his hind legs, listen with a passionate earnestness, and with an expression so like humanity on his face, that to those who watched, the moment was one of intense grief. Like a discordant note came the song of the mockingbird, as he mimicked the crying Otter. The agony of that moment was tragical, and the memory of it too sad to dwell upon.

"Every effort was made to interest the sad little creature, but for days he seemed to have only one absorbing thought. The other pair would come to him, and caress him, as was their usual fashion, inviting a roll and a tumble. He would turn his little black eyes from one to the other, with a pitiful look of anguish, and quietly walk away. He did not repel; he simply refused to be comforted. When exhausted, he sought some secluded spot, refusing to sleep with his playfellows, as had been his custom before the death of his mate, when the four cuddled in one nest. To follow him, or attempt any kindness, was indeed a hollow mockery, and only tended to increase his sorrow. With a heart yearning for the sorrowing little creature, the irresistible impulse was to divert him; in short, it seemed impossible to remain away from him. Being approached, as he crouched in some corner, he would raise his head, and with a pitying cry, like some human creature, seemed to plead to be let alone with his sorrow. Around his little eyes, and running down his face were tears—the tears of a dumb creature for his mate."[76]

So also has Enos A. Mills told us of the wild one, the Otter bereft of his mate, wandering and wailing for days.

Need we wonder, then, that such devoted and affectionate creatures are accredited not only with mourning, but decently burying their dead? Were the statement issued by any less careful and experienced naturalist than Manly Hardy, we might hesitate to accept it. In his essay, so often quoted here, he says: "When Otters are caught in log slide-traps, or killheags, other Otters quite often cover them up nicely with moss or leaves."[77]

[76] Otter Pets, p. 84.

[77] The Otter, p. 371.

The Soul of the Otter

I set out to assemble the fragments that should spell to us the Lives of our Wild Things as they really are—knowing that we had so long been told that they were dumb, brute beasts; suspecting that we ourselves were cowards and liars in so placing them. I have had some joys and some shocks in my searches for truth. There be some in whom I found no good, but there be others whose lives and characters are noble. I have held up the true and grand old Grizzly, safe in his might, and asking only to be let alone. I have told of the Wolf as he really is—brave, furtive, loyal to his mate, desperate in hunger or in war, counting three against him as an equal fight. I have learned to love and reverence his undying fortitude.

But of all the beasts whose Lives I have tried to tell, there is one that stands forth, the Chevalier Bayard of the wilds—without fear and without reproach. That is the Otter, the joyful, keen, and fearless Otter; mild and loving to his own kind, and gentle with his neighbour of the stream; full of play and gladness in his life, full of courage in his stress; ideal in his home, steadfast in death; the noblest little soul that ever went four-footed through the woods.

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